TRANSACTIONS,

OF THE

Horticultural Society

OF

LONDON.

Volume I.

3rd EDITION.

LONDON.

Printed by W. Bulmer, & Co. Cleveland Row

Sold by J. Matchard Piccadilly.

MDCCCXX.

Mo. Bot. Garden
1897.

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CHARTER

OF

THE HORTICULTURAL SOCIETY

OF

LONDON.

GEORGE the Third, by the Grace of God, of the United Kingdom of Great Britain and Ireland, King, Defender of the Faith, To all to whom these Presents shall come, Greeting: Whereas several of Our loving Subjects are desirous of forming a Society for the Improvement of Horticulture in all its branches, Ornamental as well as Useful, and

Object of the Society.

having subscribed considerable sums of money for that purpose, have humbly besought Us to grant unto them and such other persons as shall be approved and elected as herein after is mentioned, Our Royal Charter of Incorporation for the purposes aforesaid.

Incorporation.

Know Ye, that We, being desirous to promote such Improvement, have, of Our especial Grace, certain knowledge, and mere motion, Given and Granted: And We do hereby give and grant, that Our Right Trusty and well beloved Cousin and Counsellor George, Earl of Dartmouth, Knight of the most Noble Order of the Garter; Our Right Trusty and well beloved Cousin and Counsellor Edward, Earl Powis; Our Right Reverend and well beloved Father in God Brownlow, Lord Bishop of Winchester; Our Right Trusty and well beloved John, Lord Selsey; Our Right Trusty and well beloved Counsellor Charles Greville; Our Right Trusty and well beloved Counsellor Sir Joseph Banks, Baronet, and Knight of the most Honourable Order of the Bath; Our Trusty and well beloved, William Townsend Aiton, John Elliot, Thomas Andrew Knight, Charles Miller, Richard Anthony Salisbury, and John Trevelyan, Esquires; and James Dickson, Thomas Hoy and William Smith, Gardeners; and such others as shall from time to time be appointed and elected in the manner herein after directed, and their Successors, be, and shall for ever hereafter continue and be, by virtue of these Presents,

Corporate Name.

one Body Politic and Corporate, by the name of "The "HORTICULTURAL SOCIETY OF LONDON;" and them and their Successors, for the purposes aforesaid, We do hereby constitute and declare to be one Body Politic and Corporate, and by the same name to have perpetual Succession, and for ever hereafter to be persons able and capable in the Law

and have power to purchase, receive, and possess, any Goods and Chattels whatsoever, and (notwithstanding the Statutes of Mortmain) to purchase, hold, and enjoy, to them and their Successors, any Lands, Tenements, and Hereditaments, whatsoever, not exceeding, at the time or times of purchasing such Lands, Tenements, and Hereditaments respectively, the yearly value at a Rack Rent of One Thousand Pounds in the whole, without incurring the penalties or forfeitures of the Statutes of Mortmain, or any of them; and by the name aforesaid to sue and be sued, plead and be impleaded, answer and be answered unto, defend and be defended in all Courts, and places whatsoever, of Us, Our Heirs, and Successors, in all Actions, Suits, Causes, and Things, whatsoever; and to act and do, in all things relating to the said Corporation, in as ample manner and form as any other our Liege Subjects, being Persons able and capable in the Law, or any other Body Politic or Corporate, in Our said United Kingdom of Great Britain and Ireland, may or can act or do; And also to have and to use a Common Seal, and the same to change and alter from time to time as they shall think fit. And We do hereby declare and grant that there shall be an indefinite number of Fellows of the said Society; and that they the said George, Earl of Dartmouth; Edward, Earl Powis; Brownlow, Lord Bishop of Winchester; John, Lord Selsey; Charles Greville, Sir Joseph Banks, William Townsend Aiton, John Elliot, Thomas Andrew Knight, Charles Miller, Richard Anthony Salisbury, John Trevelyan, James Dickson, Thomas Hoy, and William Smith, shall be the first Fellows of the said Society, and that any five or more of them, all having been first duly summoned to attend the Meetings of the said Fellows, shall and may, on or before

Power to purchase, &c.

Land of the yearly value of £1000.

To sue and be sued.

Common Seal.

Number of Fellows indefinite.

First Fellows

Any five or more of them shall on or before the 1st

of May 1809, appoint other Members.

the First Day of May next ensuing the date of these presents, under their respective Hands, in writing, appoint such other persons to be Fellows, Honorary Members, and Foreign Members of the said Society, as they may respectively think fit. And We do further declare and grant, that, for the better Rule and Government of the said Society, and for the better direction, management, and execution of the Business and Concerns thereof, there shall be thenceforth for ever, a Council, President, Treasurer, and Secretary, of the said Society, to be elected in manner herein after mentioned; and that

Council to consist of 15 Fellows.

such Council shall consist of fifteen Members to be elected from among the Fellows as herein after directed, whereof any five shall be a quorum; and we do hereby nominate

First Council named.

and appoint the said George, Earl of Dartmouth; Edward, Earl Powis; Brownlow, Lord Bishop of Winchester; John, Lord Selsey; Charles Greville, Sir Joseph Banks, William Townsend Aiton, John Elliot, Thomas Andrew Knight, Charles Miller, Richard Anthony Salisbury, John Trevelyan, James Dickson, Thomas Hoy, and William Smith, to be the first Council; the said George, Earl of Dartmouth, to be the

First President, First Treasurer, First Secretary.

first President; the said Charles Greville to be the first Treasurer; and the said Richard Anthony Salisbury to be the first Secretary to the said Society; all and each of the

To continue in Office till 1st May, 1810.

aforesaid Officers and Counsellors to continue in such their respective Offices until the First Day of May, One Thousand Eight Hundred and Ten: and that the said George,

The first President to appoint 4 Members of the first Council to be Vice-Presidents.

Earl of Dartmouth, shall have power to appoint such four persons, from and amongst the Members of the said Council, to be Vice-Presidents of the said Society, as he shall think fit, until some other persons shall be chosen in their respective rooms, in the manner herein after mentioned. And it is Our

further will and pleasure that the Fellows of the said Society, or any eleven or more of them, shall and may on the First Day of May, One Thousand Eight Hundred and Ten, and also shall and may on the First Day of May, in every succeeding year, unless the same shall happen to be on a Sunday, and then, on the day following, assemble together at the then last or other usual place of meeting of the said Society, and proceed, by method of Ballot, to put out and remove any three of the Members who shall have composed the Council of the preceding year, and shall and may in like manner by method of Ballot, elect three other discreet persons from amongst the Fellows of the said Society to supply the places and offices of such three as may have been so put out and removed; it being Our Royal Will and Pleasure that one fifth of the Members of the said Council and no more shall be annually changed and removed by the Fellows of the said Society: And also that they the said Fellows, or any eleven or more of them, shall and may at the time and in manner aforesaid, by method of Ballot, elect from amongst the Members of the said Council, when formed and elected in manner aforesaid, three fit and proper persons; one of such Persons to be President, another of such Persons to be Treasurer, and the other of such Persons to be Secretary of the said Society, for the year ensuing: And also, in like manner, shall and may, in case of the death of any of the Members of the Council, or of the President, Treasurer, or Secretary, for the time being, within the space of two months next after such death or deaths, in like manner elect other discreet Persons, being Fellows of the said Society, to supply the places and offices of such Members of the said Council, or of the President, Treasurer, or Secretary so dying: And

The first Fellows, or any 11 or more of them, on the 1st of May, 1810, and yearly thereafter, shall by ballot remove 3 Members of the Council for the preceding year, and elect 3 other Fellows in their room.

And shall elect from amongst the Council a President, Treasurer, and Secretary for the year ensuing.

Vacancies in the Council, &c. occasioned by death to be filled up within two months.

Fellows to appoint such other Officers as they may think fit.

also shall and may appoint such other Persons to be Officers of the said Society for the year ensuing, as they may think proper and necessary for the transacting and managing the Business thereof. And it is Our further Will and Pleasure that, so soon after the Elections aforesaid, as conveniently may be, the Person who shall at any time hereafter be elected to be President of the said Society, in manner aforesaid, may and shall nominate and appoint four Persons, being Members of the said Council, to be Vice Presidents of the said Society for the year ensuing. And We do further declare and grant, that, from and after the said First Day of May now and next ensuing, the Fellows of the said Society, or any seven or more of them, shall and may have power from time to time at the general Meetings of the said Society, to be held at the usual place of Meeting of the said Society, or at such other place as shall have been in that behalf appointed, by method of Ballot, to elect such Persons to be Fellows, Honorary Members, and Foreign Members, of the said Society; and all Fellows, Honorary Members, and Foreign Members, to remove from the said Society as they shall think fit. Provided that no such Fellow, Honorary Member, and Foreign Member, shall be declared elected or removed, unless it shall appear upon such Ballot, that two thirds of the Fellows present at such Meeting shall have voted for the same. And We do further declare and grant that the Council hereby appointed, and the Council of the said Society for the time being, or any three or more of them, all the Members thereof having been first duly summoned to attend the Meetings thereof, shall and may have power according to the best of their judgment and discretion to make and establish such Bye Laws as they shall deem useful and

The President annually to appoint 4 Vice-Presidents.

Power of electing and removing Members after the first of May next, vested in the Fellows or any 7 or more of them.

But two thirds at least of the Fellows present must vote for such Election or removal.

The Council or any 3 or more of them, all having been summoned, empowered to make Bye Laws.

necessary for the regulation of the said Society, and of the Estate, Goods, and Business thereof, and for fixing and determining the times and places of meeting of the said Society, and also the times, place, and manner of electing, appointing, and removing all Fellows, Honorary Members, and Foreign Members, of the said Society, and all such Subordinate Officers, Attendants, and Servants, as shall be deemed necessary or useful for the said Society; and also for filling up from time to time any vacancies which may happen by Death, removal or otherwise, in any of the Offices or Appointments, constituted or established for the execution of the Business and Concerns of the said Society; and also for regulating and ascertaining the qualifications of Persons to become Fellows, Honorary Members, and Foreign Members, of the said Society, respectively; and also the Sum and Sums of Money to be paid by them respectively, whether upon admission or otherwise, towards carrying on the purposes of the said Society. And such Bye Laws from time to time, to vary, alter, or revoke, and make such new and other Bye Laws as they shall think most useful and expedient, so that the same be not repugnant to these Presents or the Laws of this Our Realm. Provided that no Bye Law hereafter to be made, or alteration or repeal of any Bye Law which shall hereafter have been established, by the said Council hereby appointed, or by the Council for the time being of the said Society, shall be considered to have passed, and be binding on the said Society, until such Bye Law, or such alteration or repeal of any Bye Law, shall have been hung up in the Common Meeting Room of the said Society, and been read by the President, or by any one of the Vice-Presidents for the time being, at two successive General

And to alter such Bye Laws.

But no Bye Law or alteration shall be binding on the Society, until it shall have been confirmed by Ballot at a General Meeting, seven Fellows at least being present.

Meetings of the said Society, and until the same shall have been confirmed by Ballot, by the Fellows at large of the said Society; such Ballot to take place at the ensuing Meeting next after such two successive General Meetings of the said Society, seven at least of the Fellows of the said Society being then present: And Provided that no such Bye Law, or alteration or repeal of any Bye Law, shall be deemed or taken to pass in the affirmative, unless it shall appear upon such Ballot, that two-thirds of the Fellows present at such Meeting shall have voted for the same. Witness, His Majesty, at Westminster, the 17th day of April, in the Forty-ninth year of our reign.

By writ of Privy Seal,

WILMOT.

PREFACE

TO THE THIRD EDITION

OF THE

FIRST VOLUME.

The Prefaces to the Second and Third Volumes of the Transactions of the Horticultural Society, have briefly noticed the progress of the Society from the periods at which they respectively appeared. The demand for a new edition of the First Volume, now affords an opportunity of laying before the Public a short account of the Institution of the Society, and its advances, to the year 1818, the time when the Preface to the Second Volume was written.

The idea of establishing a Society for the improvement of Horticulture, originated with John Wedgwood, Esq. of Betley, in Staffordshire; and, at his instance, a Meeting was held at the house of Mr. Hatchard, the Bookseller in Piccadilly, on the seventh of March, 1804, to take into consideration the most effectual means of accomplishing the object desired. At this Meeting, which was attended by the Right Hon. Charles Greville, the Right Hon. Sir Joseph Banks, Bart., Richard Anthony Salisbury, Esq.,

William Townsend Aiton, Esq., Mr. William Forsyth, and Mr. James Dickson, Mr. Wedgwood presided, and such Resolutions were passed as were deemed necessary for the immediate regulations of the infant Society. It was also agreed, that each of these original Members should have the privilege of recommending three persons to become Members; and on the fourteenth of the same month a second Meeting was held at Mr. Hatchard's, when the name of John Hawkins, Esq. was added to the number of original Members, with a similar privilege of nomination.

From the year 1804, to the spring of 1809, the Society continued to increase; the Members, after the first nominations, being chosen by ballot; and as it was daily acquiring a character which promised fair to place it beyond the vicissitudes arising from fashion or caprice, those Gentlemen who took an active share in its direction, felt the propriety of obtaining its incorporation by Royal Charter. This was accomplished; and the Charter, as will be seen, bears date the seventeenth of April, 1809.

From a very early period of the Society, its proceedings had been in course of publication, and in the year 1812 the First Volume was completed. It will not be surprising that so much time was occupied in its formation, when it is considered, that in their infancy, all public Institutions are necessarily less capable of effort than in their more advanced stages. But although the Transactions of the Horticultural Society had met the public eye at considerable intervals of

time, their influence was by no means trifling. Through them the practical Gardener found an opportunity of communicating to the world the result of his experience; and details of practice were thus obtained, which could not be met with in other works, embracing a more general view of Horticulture. The valuable physiological and practical papers, also, by Mr. KNIGHT, were gradually leading the Amateur, as well as the Gardener, to take a higher and more extended view of that science, which formed the amusement of the one, and the occupation of the other.

The system which had been adopted of giving Medals for specimens of superior cultivation, or for the introduction of new fruits or esculent vegetables of approved excellence, had been productive of the best results; and all tended to shew that patronage only was wanting to place Horticulture among the studies most useful to mankind. Since the period when this volume closed, that patronage has been increasing with a rapidity and effect, which the most sanguine friends of the Society could hardly have anticipated; and to those who have ever taken a warm interest in its concerns, it is matter of great satisfaction to see, that their labours have been rewarded with such eminent success.

Regent Street, August, 1821.

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TRANSACTIONS

OF THE

HORTICULTURAL SOCIETY.

I. *Introductory Remarks relative to the Objects which the Horticultural Society have in view.* *By* Thomas Andrew Knight, *Esq. F. R. S. &c.*

Read April 2, 1805.

WERE it possible to ascertain the primeval state of those vegetables which now occupy the attention of the gardener and agriculturist, and immediately, or more remotely, conduce to the support and happiness of mankind; and could we trace out the various changes which art or accident has, in successive generations, produced in each, few inquiries would be more extensively interesting. But we possess no sources from which sufficient information to direct us in our inquiries can be derived; and are still ignorant of the native country, and existence in a wild state, of some of the most important of our plants. We, however, know that improved flowers and fruits are the necessary produce of improved culture; and that the offspring, in a greater or less

degree, inherits the character of its parent. The austere Crab of our woods has thus been converted into the Golden Pippin; and the numerous varieties of the Plum, can boast no other parent than our native Sloe. Yet few experiments have been made, the object of which has been new productions of this sort; and almost every ameliorated variety of fruit appears to have been the offspring of accident, or of culture applied to other purposes. We may therefore infer, with little danger of error, that an ample and unexplored field for future discovery and improvement lies before us, in which nature does not appear to have formed any limits to the success of our labours, if properly applied.

The physiology of vegetation has deservedly engaged the attention of the Royal and Linnean Societies; and much information has been derived from the exertions of those learned bodies. Societies for the improvement of domestic animals, and of Agriculture in all its branches, have also been established with success, in almost every district of the British Empire. Horticulture alone appears to have been neglected, and left to the common gardener, who generally pursues the dull routine of his predecessor; and if he deviates from it, rarely possesses a sufficient share of science and information to enable him to deviate with success.

The establishment of a national society for the improvement of Horticulture has therefore long been wanted; and if such an institution meet with a degree of support proportionate to the importance of its object: if it proceed with cautious circumspection to publish well ascertained facts

only, to detect the errors of ignorance, and to expose the misrepresentations of fraud ; the advantages which the public may ultimately derive from the establishment, will probably exceed the most sanguine hopes of its founders.

Horticulture, in its present state, may with propriety be divided into two distinct branches, the useful, and the ornamental : the first must occupy the principal attention of the members of the Society, but the second will not be neglected ; and it will be their object, wherever it is practicable, to combine both.

Experience and observation appear to have sufficiently proved, that all plants have a natural tendency to adapt their habits to every climate in which art or accident places them : and thus the Pear-tree, which appears to be a native of the southern parts of Europe, or the adjoining parts of Asia, has completely naturalized itself in Britain, and has acquired, in a great number of instances, the power to ripen its fruit in the early part even of an unfavourable summer : the Crab tree has in the same manner adapted its habits to the frozen regions of Siberia. But when we import either of these fruits, in their cultivated state, from happier climates, they are often found incapable of acquiring a perfect state of maturity even when trained to a south wall.

As the Pear and Crab tree, in the preceding cases, have acquired powers of ripening their fruits in climates much colder than those in which they were placed by nature, we have some grounds of hope that the Vine and Peach tree may be made to adapt their habits to our climate, and to ripen their fruits without the aid of artificial heat, or the reflection of a wall ; and though we are at present little

acquainted with the mode of culture best calculated to produce the necessary changes in the constitution and habit of plants, attentive observation and experience will soon discover it; and experiments have already been made, which prove the facility of raising as fine varieties of fruit in this country, as any which have been imported from others.

Almost every plant, the existence of which is not confined to a single summer, admits of two modes of propagation; by division of its parts, and by seed. By the first of these methods we are enabled to multiply an individual into many; each of which, in its leaves, its flowers, and fruit, permanently retains, in every respect, the character of the parent stock. No new life is here generated; and the graft, the layer, and cutting, appear to possess the youth and vigour, or the age and debility, of the plant, of which they once formed a part.* No permanent improvement has therefore ever been derived, or can be expected, from the art of the grafter, or the choice of stocks of different species, or varieties: for, to use the phrase of Lord Bacon, the graft in all cases *overruleth the stock*, from which it receives *aliment, but no motion*. Seedling plants, on the contrary, of every cultivated species, sport in endless variety. By selection from these, therefore, we can only hope for success in our pursuit of new and improved varieties of each species of plant or fruit; and to promote experiments of this kind, the Horticultural Society propose to give some honorary premiums

* The diseased state of young grafted trees of the Golden Pippin, and the debasement of the flavour of that fruit, afford one, amongst a thousand instances, which may be adduced, of the decay of those varieties of fruit which have been long propagated by grafting, &c.

to those who shall produce before them, or such persons as they shall appoint, valuable new varieties of fruit, which, having been raised from seeds, have come into existence since the establishment of the institution.

In the culture of many fruits, without reference to the introduction of new varieties, the Society hope to be able to point out some important improvements. Several sorts, the Walnut and Mulberry for instance, are not produced till the trees have acquired a very considerable age; and therefore, though the latter fruit is highly valued, it is at present very little cultivated. But experiments have lately been made, which prove that both Walnut and Mulberry trees may be readily made to produce fruit at three years old; and there appears every reason to believe, that the same mode of culture would be equally successful in all similar cases.

In training Wall trees, there is much in the modern practice which appears defective and irrational: no attention whatever is paid to the form which the species or variety naturally assumes; and be its growth upright, or pendent, it is constrained to take precisely the same form on the wall.

The construction of Forcing houses appears also to be generally very defective, and two are rarely constructed alike, though intended for the same purposes: probably not a single building of this kind has yet been erected, in which the greatest possible quantity of space has been obtained, and of light and heat admitted, proportionate to the capital expended. It may even be questioned, whether a single Hotbed has ever been made in the most advantageous form; and the proper application of glass, where artificial heat is not employed, is certainly very ill understood.

Every gardener is well acquainted with methods of applying manure, with success, to annual plants; for these, as EVELYN has justly observed, *having but little time to fulfil the intentions of nature*, readily accept nutriment in almost any form in which it can be offered them: but trees, being formed for periods of longer duration, are frequently much injured by the injudicious and excessive use of manure. The gardener is often ignorant of this circumstance; and not unfrequently forms a compost for his Wall trees, which for a few years stimulating them to preternatural exertion, becomes the source of disease, and early decay.

It is also generally supposed that the same ingredients, and in the same proportion to each other, which are best calculated to bring one variety of any species of fruit to perfection, are equally well adapted to every other variety of that species: but experience does not justify this conclusion; and the Peach in many soils acquires a high degree of perfection, where its variety, the Nectarine, is comparatively of little value; and the Nectarine frequently possesses its full flavour in a soil, which does not well suit the Peach. The same remark is also applicable to the Pear and Apple; and as defects of opposite kinds occur in the varieties of every species of fruit, those qualities in the soil, which are beneficial in some cases, will be found injurious in others. In those districts where the Apple and Pear are cultivated for Cyder and Perry, much of the success of the planter is found to depend on his skill, or good fortune, in adapting his fruits to the soil.

The preceding remarks are applicable to a part only of the objects which the Horticultural Society have in view; but

they apply to that part in which the practice of the modern gardener is conceived to be most defective, and embrace no inconsiderable field of improvement.

In the execution of their plan, the Society feels that they have many difficulties to encounter, and some prejudices to contend with; but they have long been convinced, as individuals, and their aggregate observations have tended only to increase their conviction, that there scarcely exists a single species of esculent plant or fruit, which (relative to the use of man) has yet attained its utmost state of perfection; nor any branch of practical horticulture, which is not still susceptible of essential improvement: and, under these impressions, they hope to receive the support and assistance of those who are interested in, and capable of promoting, the success of their endeavours.

II. *An Attempt to ascertain the Time when the Potatoe* (Solanum tuberosum) *was first introduced into the United Kingdom; with some Account of the Hill Wheat of India. By the Right Hon. Sir* Joseph Banks, *Bart. K. B. P. R. S. &c.*

Read May 7, 1805.

THESE notes on the introduction of the *Potatoe*, which it is hoped will not be found uninteresting to the Society, were chiefly collected by my worthy and learned friend Mr. DRYANDER, some of them from authorities not easily accessible. Those on the *Wheat*, though not within the immediate object of this Society, will I hope, be considered as sufficiently interesting to be laid before them; could we trace the origin of any one of our cultivated plants, it may, and probably will, lead to the discovery of others.

The Potatoe now in use (Solanum tuberosum) was brought to England by the colonists sent out by Sir WALTER RALEIGH, under the authority of his patent, granted by Queen ELIZABETH, " for discovering and planting new countries, not possessed by Christians," which passed the great seal in 1584. Some of Sir WALTER's ships sailed in the same year; others, (on board one of which was THOMAS HERRIOT, afterwards known as a mathematician,) in 1585; the whole however returned on the 27th of July, 1586, and probably brought with them the Potatoe.

This Mr. THOMAS HERRIOT, who was probably sent out to examine the country, and report to his employers the

nature and produce of its soil, wrote an account of it, which is printed in the first Volume of DE BRY's *Collection of Voyages.* In this account, under the article of roots, at page 17, he describes a plant called Openawk : "These roots," says he, "are round, some as large as a walnut, others much larger; they grow in damp soil, many hanging together, as if fixed on ropes; they are good food, either boiled or roasted."

GERARD, in his Herbal, published in 1597, gives a figure of the Potatoe, under the name of Potatoe of Virginia; and tells us that he received the roots from Virginia, otherwise called Norembega.

The manuscript minutes of the Royal Society, December 13, 1693, tells us, that Sir ROBERT SOUTHWELL, then President, informed the fellows, at a meeting, that his grandfather brought Potatoes into Ireland, who first had them from Sir WALTER RALEIGH.

This evidence proves, not unsatisfactorily, that the Potatoe was first brought into England, either in the year 1586, or very soon after, and sent from thence to Ireland, without delay, by Sir ROBERT SOUTHWELL's ancestor, where it was cherished and cultivated for food before the good people of England knew its value; for GERARD, who had this plant in his garden in 1597, recommends the roots to be eaten as a delicate dish, not as common food.

It appears, however, that it first came into Europe, at an earlier period, and by a different channel; for CLUSIUS, who at that time resided at Vienna, first received the Potatoe in 1598, from the governor of Mons, in Hainault, who had procured it the year before from one of the attendants of the Pope's legate, under the name of Taratoufli; and

learned from him, that in Italy, where it was then in use, no one certainly knew whether it originally came from Spain, or from America.

Peter Cieca, in his Chronicle, printed in 1553, tells us, chap. xl. page 49, that the inhabitants of Quito, and its vicinity, have, besides Mays, a tuberous root, which they eat, and call Papas; this, Clusius guesses to be the plant he received from Flanders, and this conjecture has been confirmed by the accounts of travellers, who have visited the country since that period.

From these details we may fairly infer, that Potatoes were first brought into Europe from the mountainous parts of South America, in the neighbourhood of Quito; and, as the Spaniards were the sole possessors of that country, there is little doubt of their having been first carried into Spain; but as it would take some time to introduce them into use in that country, and afterwards to make the Italians so well acquainted with them as to give them a name,* there is every reason to believe they had been several years in Europe, before they were sent to Clusius.

The name of the root, in South America, is Papas, and in Virginia, it was called Openawk; the name of Potatoe was therefore evidently applied to it on account of its similarity in appearance to the Battatas, or Sweet Potatoe; and our Potatoe appears to have been distinguished from that root, by the appellative of Potatoe of Virginia, till the year 1640, if not longer.†

Some authors have asserted, that Potatoes were first dis-

* Taratoufli signifies also truffles.

† Gerard's Herbal, by Johnson, page 927.

covered by Sir FRANCIS DRAKE, in the South Seas, and others, that they were introduced into England, by Sir JOHN HAWKINS; but in both instances the plant alluded to is clearly the Sweet Potatoe, which was used in England, as a delicacy, long before the introduction of our Potatoes; it was imported in considerable quantities from Spain, and the Canaries, and was supposed to possess the power of restoring decayed vigour. The "kissing comfits" of FALSTAFF,* and other confections of similar imaginary qualities, with which our ancestors were duped, were principally made of these, and of Eringo roots.

The Potatoes themselves were sold by itinerant dealers, chiefly in the neighbourhood of the Royal Exchange, and purchased, when scarce, at no inconsiderable cost, by those who had faith in their alleged properties. The allusions to this opinion are very frequent in the plays of that age.

Every anecdote that tends to throw light on the introduction, or on the probable origin, of plants now cultivated for use, is certainly interesting, even though it is not quite perfect; I venture, therefore, to add the following.

Seven or eight years ago, Mr. LAMBERT brought to me a small paper of seeds, on which was written, "*Hill Wheat;*" I opened it, and found the seeds contained to be scarcely larger than those of our wild grasses; but when viewed through a lens, they perfectly resembled grains of Wheat.

Of these seeds, he was so good as to spare me a few, which

* "Let it rain potatoes, and hail kisssing comfits." Merry Wives of Windsor, Act v. Scene 5.

Parkinson's Paradisus Terrestris, p. 518. Gerard's Herbal, 1697, p. 780.

I sowed in a garden, the remainder he sowed; our crops very unexpectedly proved to be Wheat of the spring kind, and the usual size, the grains of which were nearly, if not quite, as large as those of the ordinary spring Wheat.

On this, Mr. LAMBERT applied to Mrs. BARRINGTON, from whom he had received the seeds, for information of the country from whence they came; but she had, among the multiplicity of seeds received by her about the same time, forgot the exact history of them; all she knew was, that they came from India, but from what part of India, she did not recollect.

From the writing on the paper, "*Hill Wheat*," it is probable they came either from the Peninsula, or from the hilly country, far within land from Bengal, as the province of Bengal itself is a flat alluvial soil, entirely level.

This Hill Wheat, however, is no doubt known by some persons, who either are now in India, or have returned from thence into this country; and it is certainly a matter of some importance to know what they can inform us on the subject of it; especially whether this Wheat is a cultivated, or a wild plant; as we shall, if the latter is the case, ascertain two of the greatest desiderata of cultivators; the country where Wheat grows spontaneously; and the nature of the grain in its original state, when unassisted by the fostering hand of man.

III. *On the Cultivation of the* Crambe Maritima *of* Linneus, *or* Sea Kale. *By Mr.* John Maher, *F. H. S.*

Read November 2, 1805.

If the man who makes two blades of grass grow where only one grew before, is to be esteemed an important benefactor to his country; he who teaches us how to improve a palatable and nutritious vegetable, hitherto often neglected upon the barren cliffs of our sea-girt isle, has surely no small claims to our gratitude; as such, I must ever regard those of the late Mr. Curtis, from whose pamphlet upon the *Crambe Maritima*, or *Sea Kale*, I first learnt how to grow this early escu-lent; but as his useful directions are yet in the hands of comparatively few of my brother gardeners, and as the young shoots have been obtained at Edmonton, of a size and delicacy greatly superior to what generally appears at the table, I venture to offer a particular account of the method of cultivating it there to the Horticultural Society. For the botanical description prefixed, I am indebted to our Secretary.

CRAMBE.

Ordo Naturalis.

Cruciferæ. *Juss. Gen.* p. 242.

Sect. II. Fructus brevis, siliculosus.

Calyx incurvo-patulus. Petala breviter unguiculata, ampla. Filamenta longiora bifurca apice altero antherifero. Torus inter eadem biglandulosus. Stigma sessile. Peri-

carpium carnosum, subglobosum, monospermum, clausum deciduum. *Plantæ maritimæ, facie* Brassicarum. *Folia glauca, magna, plus minus sinuata. Flores albidi, paniculâ densiusculâ ramosissimâ.*

C. (*maritima*) caule foliisque inermibus: petalis late obcordatis.

C. maritima. *Smith in Engl. Bot.* n. 924, *cum Ic.* optimâ. C. maritima. *Curt. Monogr. cum Ic.* bonâ. C. maritima. *Mill. Gard. Dict. ed. a Martyn. n.* 1. C. maritima. *With. Arr. ed.* 4. p. 563. C. maritima. *Bryant Fl. Diæt.* p. 124. C. maritima. *Fl. Dan.* t. 316. C. maritima. *Linn. Sp. Pl. ed.* 2. p. 437. C. maritima. *Mill. Gard. Dict. ed.* 1. p. 1. C. maritima. &c. *Raii Syn.* p. 307.

Brassica maritima. *C. Bauh. Pin.* p. 112.

Brassica marina monospermos. *Park. Th.* p. 270.

Brassica marina Anglica. *Ger. emac.* p. 315. f. 15.

Brassica marina sylvestris. *Ger. Herb.* p. 248. f. 16.

Brassica Dobrica. *Turn. Herb.* p. 90.

Brassica marina sylvestris multiflora monospermos. *Lob. Adv. nov.* p. 93.

Sea Kale, *Anglis.*

Sponte nascitur in Ins. *Great Britain* littoribus abunde, solo præcipue argillaceo et lapidoso.

Floret *Maio, Junio.*

The particular places on record where this plant grows wild, are below *Maryport;* also between *Ravenglass* and *Bootle*, in Cumberland; at *Roosebeck*, in Lower Furness, Lancashire; near *Conway*, plentifully, but in the most inaccessible rocks; promontory of *Llyn*, and near *Cruccaeth*,

in Caernarvonshire; between *Rhuddgaer* and *Llandwyn*, in the Isle of Anglesea; about *Port Inon*, in Glamorganshire; near *Mevagissey*, in Cornwall; marly cliffs, near *Teignmouth*, and *Sidmouth*, in Devonshire; on *Chesil Bank*, chalk cliffs at *Weymouth*, *Lulworth Cove*, and about *Poole*, in Dorsetshire; at *Western Court*, in Hampshire; near *Worthing* and *Shoreham*, cliffs at *Beachy Head*, and near *Hastings*, in Sussex; between *Folkstone* and *Dover*; at *St. Margaret's* and *Langdon Bays*, between *Whitstable* and the *Isle of Thanet*, at *Liddie*, in Kent; near *Harwich*, in Essex; on the north coast of *Norfolk*, abundantly; near *Fast-castle*, Berwickshire. According to Dr. SMITH, sandy shores are its natural soil, but by what I can learn from others, as well as my own personal observation, it prefers loamy cliffs, mixed with gravel. I found it near *Dover*, also in *Sussex*, in stiff loam: to the extensive beach of pure sand, both above and below *Scarborough*, in Yorkshire, it is, I believe, quite a stranger.

The whole plant is smooth, of a beautiful glaucus hue, covered with a very fine meal: occasionally, however, it varies like the wallflower-leaved ten-weeks Stock, with quite green leaves. Root dark brown, perennial, running deep into the ground, divided into numerous wide spreading branches, but not creeping.* Radical leaves very large, and spreading wide upon the ground, waved, more or less sinuated,

* Root not creeping, in the proper sense of that word, as Parkinson, Miller, and Bryant have described it; but if the branches be divided into a number of pieces, each piece will grow if committed to the earth: and as it is impossible to dig among the widely extended roots of these plants without cutting many of them, and leaving a number of fragments, plants arise from such around the original, and give to it the appearance of having creeping roots. CURT.

and indented, containing a bud, or rudiment of the next year's stem at the bottom of the leaf-stalk, dying away in the autumn.* Stems several, from one foot and a half to two feet high, erect, branching alternately, and terminating in large panicles of spiked flowers, which smell somewhat like honey. Peduncles, as the fruit swells, considerably elongated. Calyx often tinged with purple, its leaflets nearly equal. Petals cream coloured, with purple claws, larger than in many genera of this natural order. Filaments purple. Anthers pale yellow. Glands of the receptacle between the longer filaments yellowish green. Stigma pale yellow. Pouch, as the accurate Mr. Woodward describes it in Withering's work, at first egg-shaped, afterwards nearly globular, fleshy, falling off when ripe, about August, with the seed in it, which is large, and of a pale brown colour.

The *Crambe Maritima* was known and sent from this kingdom to the continent more than two hundred years ago, by L'Obel, and Turner;† but our immortal countryman, Philip Miller, has the honour of being the first

* Parkinson perhaps never committed a more egregious blunder, than in the account he has given of this part of the plant's economy: "*The root is somewhat great, keeping the green leaves all the winter.*" Bryant, in his *Fl. Diæt.* misled, perhaps, by this account, says, "*The radical leaves being green all the winter,*" are cut by the inhabitants where the plant grows, and boiled as cabbage. Curt.

† It would be difficult to ascertain the precise period of its being first used with us as a culinary plant; on many parts of the coast, the inhabitants for time immemorial have been in the practice of seeking for the plant in the spring, where it grows spontaneously; and, removing the sand or pebbles, they cut off the young shoots as yet blanched, close to the roots. Mr. William Jones, of Chelsea, saw bundles of it in a cultivated state, exposed for sale in Chichester market, in the year 1753. Curt.

who wrote upon it professionally, as an esculent, telling us, in the first edition of his *Gardener's Dictionary*, published in 1731, that the inhabitants of Sussex gather the wild plant to eat in spring, soon after the heads are thrust out of the ground, otherwise it will be tough and rank. Professor MARTYN, next, in the last edition of the same work, has printed some valuable additional instructions, how to cultivate this plant, from the MS. of the Rev. Mr. LAURENT. Lastly, the late celebrated Mr. CURTIS has done more to recommend it, and diffuse the knowledge of it, in the dissertation above quoted, than any of his predecessors.

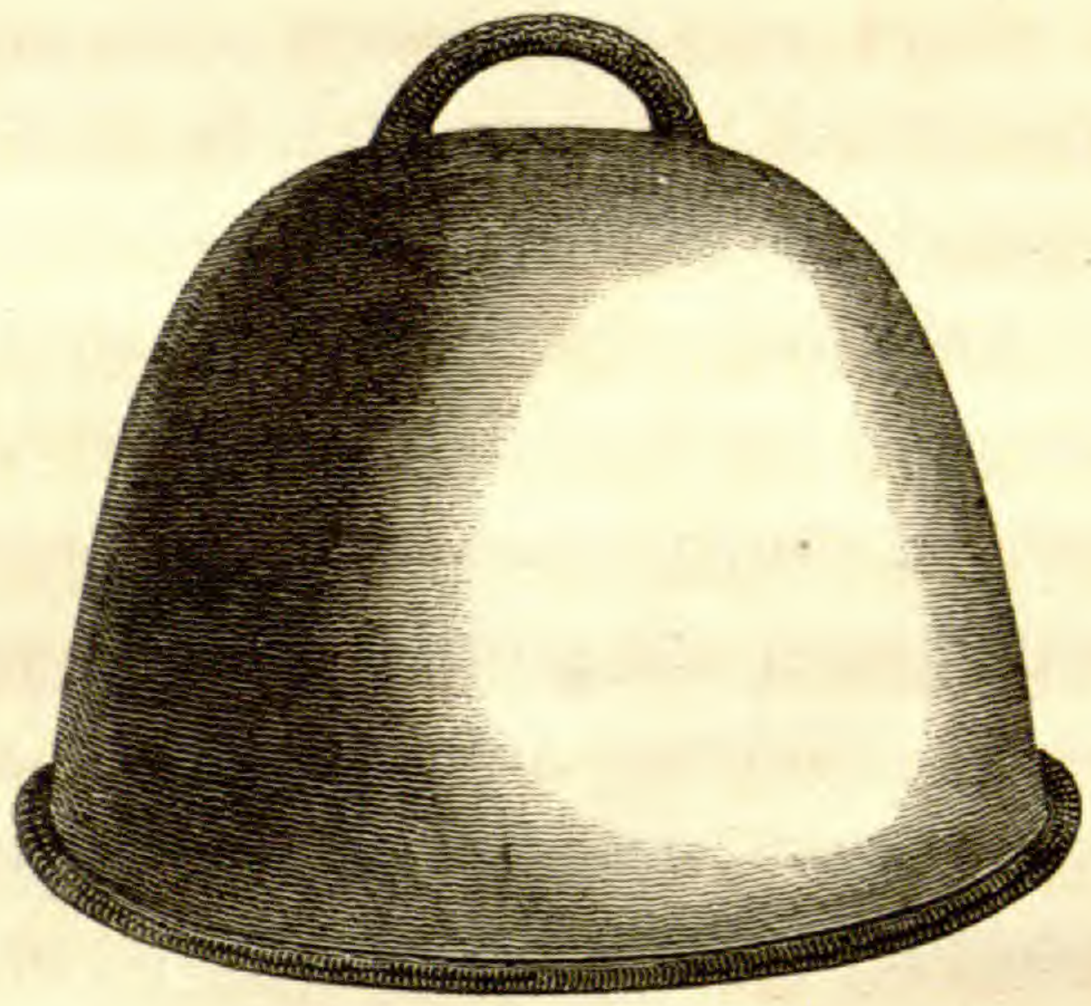
To grow this vegetable in the highest perfection, prepare the ground in December, or January, by trenching it two feet and a half deep; if not that depth naturally, and light, it must be made so artificially, by adding a due proportion of fine white sand, and very rotten vegetable mould: if the ground is wet in winter, it must be effectually drained, so that no water may stand within a foot at least of the bottom: for the strength of the plants depends on the dryness of the bottom, and richness of the soil. Then divide the ground into beds, four feet wide, with alleys of eighteen inches, after which, at the distance of every two feet each way, sow five or six seeds two inches deep, in a circle of

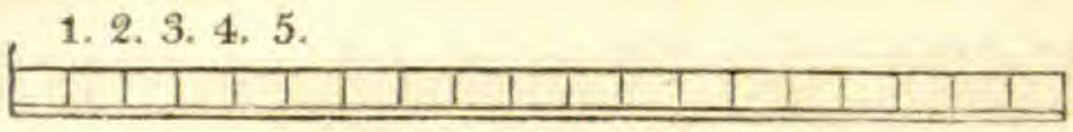
about four inches diameter; this operation must be performed with strict care and regularity, as the plants are

afterwards to be covered with the blanching pots,* of which a drawing is annexed, and both the health and beauty of the crop depend upon their standing at equal distances. In the months of May and June, if the seeds are sound, the young plants will appear. When they have made three or four leaves, take away all but three of the best plants from each circle, planting out those you pull up (which by a careful hand may be drawn with all their tap-root) in a spare bed for extra-forcing, or to repair accidents. The turnip fly and wireworm are great enemies to all the plants of the class Tetradynamia. I know no remedy for the latter, but picking them out of the ground by hand; the former may be prevented from doing much damage, by a circle of quick lime strewed round the young plants. If the months of June and July prove dry, water the whole of the beds plentifully. In the following November, as soon as the leaves are decayed, clear them away, and cover the beds an inch thick with fresh light earth and sand, that have laid in a heap and been turned over at least three times the preceding summer; this, and indeed all composts, should be kept scrupulously free from weeds, many of which nourish insects, and the compost is too often filled with their eggs and grubs. Upon this dressing of sandy loam, throw about six inches in depth of light stable litter, which finishes every thing to be done the first year.

In the spring of the second year, when the plants are beginning to push, rake off the stable litter, digging a little of

* It appears to me, that for forcing, it would be a great improvement to make the blanching pots in two pieces, the uppermost of which should fit like a cap upon the lower; the crop might then be examined at all periods without disturbing the hot dung. Secr.





Scale of Inches.

Blanching Pot for Sea Kale.

the most rotten into the alleys, and add another inch in depth of fresh loam and sand. Abstain from cutting this year, though some of the plants will probably rise very strong, treating the beds the succeeding winter exactly as before.

The third season, a little before the plants begin to stir, rake off the winter covering, laying on an inch in depth of pure dry sand, or fine gravel. Then cover each parcel with one of the blanching pots, pressing it very firmly into the ground, so as to exclude all light and air: for the colour and flavour of the vegetable is greatly injured by being exposed to either. If the beds are twenty-six feet long, and four wide, they will hold twenty-four blanching pots, with three plants under each, making seventy-two plants in a bed. Examine them from time to time, cutting the young stems, when about three inches above ground, carefully, so as not to injure any of the remaining buds below, some of which will immediately begin to swell; in this method, a succession of gatherings may be continued for the space of six weeks, after which period the plants should be uncovered, and their leaves suffered to grow, that they may acquire and return nutriment to the root for the next year's buds. The flowers, when seeds are not wanted, ought to be nipped off with the finger and thumb, when they appear. If a gentleman does not choose to be at the expence of the blanching pots, the beds must be covered with a larger portion of loose gravel, and mats; but the time and trouble of taking away the gravel from about the plants, to cut the crop, and replacing it, is so great, that there is no real economy in it. In this way Sea Kale has been cut in Mr. BEALE's garden, which measured ten, eleven, and even twelve inches in circumference, and

upon an average each blanching pot affords a dish twice in a season.

No vegetable can be so easily forced as this, or with so little expence and trouble; for the dung is in the finest possible order for spring hot-beds, after the Sea Kale is gathered. The only thing necessary, is to be very particular in guarding against too much heat, keeping the temperature under the blanching pots as near to fifty-five degrees of Fahrenheit's thermometer as may be, but never higher than sixty. For this purpose in November and December, according as you want your Sea Kale, prepare a sufficient quantity of fresh stable dung, to cover both the beds and alleys, from two to three feet high; in the quantity to be laid on the beds, a great deal must always be left to the judgment of the gardener, who will act according to the mildness or severity of the season. The dung should be closely pressed down between the blanching pots, placing heat sticks at proper intervals, which being examined occasionally will indicate the heat below. After the dung has remained four or five days, examine the pots. Worms often spring above the surface, and spoil the delicacy of the young shoots: the best remedy against these, is to cover with dry sea-coal ashes, sifted neither very small nor very large; salt also effectually destroys them, and will not injure the Sea Kale. The crop will be ready to gather in three weeks or a month from first applying the heat, but so much mischief ensues when this is violent, that I would advise every one to begin time enough, and force slowly, rather than quickly. It is also necessary to cut the leaves off a fortnight or three weeks before they decay, from such plants as you intend to force very early.

IV. *Some Hints respecting the proper Mode of inuring* Tender Plants *to our Climate. By the Right Hon. Sir* Joseph Banks, *Bart. K. B. P. R. S. &c.*

Read December 3, 1805.

Respectable and useful as every branch of the horticultural art certainly is, no one is more interesting to the public, or more likely to prove advantageous to those who may be so fortunate as to succeed in it, than that of *inuring plants*, natives of warmer climates, to bear without covering, the ungenial springs, the chilly summers, and the rigorous winters, by which, especially for some years past, we have been perpetually visited.

Many attempts have been made in this line, and several valuable shrubs, that used to be kept in our stoves, are now to be seen in the open garden; there is, however, some reason to believe, that every one of these was originally the native of a cold climate, though introduced to us through the medium of a warm one; as the Aucuba Japonica, the Pæonia Moutan, and several others, have been in our times.

In the case of annuals, however, it is probable that much has been done by our ancestors, and something by the present generation; but it must be remembered, that all that is required in the case of an annual, is to enable it to ripen its fruit in a comparatively cold summer, after which, we know that the hardest frost has no power to injure the seed, though

exposed in the open air to its severest influence ; but a perennial has to encounter frosts with its buds and annual shoots, that have sometimes been so severe with us, as to rend asunder the trunks of our indigenous forest trees.*

It is probable that Wheat, our principal food at present, did not bring its seed to perfection in this climate, till hardened to it by repeated sowings ; a few years ago some spring wheat from Guzerat was sown with barley, in a well cultivated field ; it rose, eared, and blossomed with a healthy appearance, but many ears were, when ripe, wholly without corn, and few brought more than three or four grains to perfection.

In the year 1791, some seeds of Zizania aquatica were procured from Canada, and sown in a pond at Spring Grove, near Hounslow ; it grew, and produced strong plants, which ripened their seeds : those seeds vegetated in the succeeding spring, but the plants they produced were weak, slender, not half so tall as those of the first generation, and grew in the shallowest water only ; the seeds of these plants produced others the next year, sensibly stronger than their parents of the second year.

In this manner the plants proceeded, springing up every year from the seeds of the preceding one, every year becoming visibly stronger and larger, and rising from deeper parts of the pond, till the last year, 1804, when several of the plants were six feet in height, and the whole pond was in every part covered with them as thick as wheat grows on a well managed field.

Here we have an experiment which proves, that an annual plant, scarce able to endure the ungenial summer of England,

* See Miller's Dictionary, article Frost.

has become in fourteen generations, as strong and as vigorous as our indigenous plants are, and as perfect in all its parts as in its native climate.

Some of our most common flowering shrubs have been long introduced into the gardens ; the Bay tree has been cultivated more than two centuries ; it is mentioned by TUSSER, in the list of garden plants inserted in his book, called 500 *Points of good Husbandry*, printed in 1573.

The Laurel was introduced by Master COLE, a merchant, living at Hampstead, some years before 1629, when PARKINSON published his Paradisus Terrestris, and at that time we had in our gardens, Oranges, Myrtles of three sorts, Lauristinus, Cypress, Phillyrea, Alaternus, Arbutus ; a Cactus brought from Bermudas, and the Passion flower, which last had flowered here, and showed a remarkable particularity, by rising from the ground near a month sooner if a seedling plant, than if it grew from roots brought from Virginia.

All these were at that time rather tender plants ; Master COLE cast a blanket over the top of his Laurel, in frosty weather, to protect it, but though nearly two centuries have since elapsed, not one of them will yet bear with certainty our winter frosts.

Though some of these shrubs ripen their seeds in this climate, it never has been, I believe, the custom of gardeners to sow them ; some are propagated by suckers and cuttings, and others by imported seeds ; consequently the very identical Laurel introduced by Master COLE, and some others of the plants enumerated by PARKINSON, are now actually growing in our gardens ; no wonder then, that these original shrubs have not become hardier, though probably they would have

done so, had they passed through several generations by being raised from British seeds.

Is it not then worthy a trial, as we find that plants raised from suckers or cuttings do not grow hardier by time, and as the experiments on Zizania points out the road, to sow the seeds of these and such like tender shrubs as occasionally ripen them in this climate. Fourteen generations, in the case of the Zizania, produced a complete habit of succeeding in this climate, but a considerable improvement in hardiness was evident much earlier.

In plants that require some years to arrive at puberty, fourteen generations are more than any man can hope to survive; but a much less number will in many cases be sufficient, and in all, though a complete habit of hardihood is not attained, a great progress may be made towards it in a much less time; even one generation may work a change of no small importance; if we could make the Myrtle bear the climate of Middlesex as well as it does that of Devonshire, or exempt our laurel hedges from the danger of being cut down by severe frosts, it would be an acquisition of no small consequence to the pleasure of the gentleman, as well as to the profit of the gardener.

Old as I am, I certainly intend this year to commence experiments on the Myrtle and the Laurel: I trust, therefore, it will not be thought presumptuous in me to invite those of my brethren of this most useful Society, who are younger than I am, and who of course will see the effect of more generations than I shall do, to take measures for bringing to the test of experiment, the theory I have ventured to bring forward, I hope not without some prospect of success.

The settlement lately made at New Holland, gives a large

scope to these experiments; many plants have been brought from thence which endure our climate with very little protection, and some of these arrive at puberty at an early period; we have already three from the south point of Van Diemen's Land, where the climate cannot be wholly without frost; Mimosa verticillata, Eucalyptus hirsuta, and obliqua. The first of these appears to have produced flowers within eight years of its first introduction; but as a settlement is now made very near the spot where the seeds of these Shrubs were collected, we may reasonably hope to receive further supplies, and, among them, the Winterana aromatica, an inhabitant of the inhospitable shore of Terra del Fuego, which Mr. BROWN has discovered on the south part of Van Diemen's Land also.

V. *On the French Turnep (a variety of the* Brassica Napus *of* Linnæus,*) which has long been cultivated upon the Continent. By Mr.* James Dickson, *F. L. S. Vice President.*

Read February 4, 1805.

In the report drawn up by our worthy member, Thomas Andrew Knight, Esq. at the request of a committee of the Horticultural Society, and printed by their orders; it is remarked, that nature appears to have put no limits to the success of our labours in improving vegetables, if properly applied; that thus our Wild Crab has been converted into the Golden Pippin, and that our most delicious Plumbs have originally sprung from the Sloe. The vegetable which I have now the honour of submitting to the Society, is one more among many instances of the truth of the above remark; which I have quoted, because I think it cannot be too frequently repeated, and instilled into the minds of young gardeners. Nature has undoubtedly done much in furnishing our table with a variety of esculents spontaneously, but when we aid her efforts to befriend us, by industry on our part, she, like a kind mother, never disappoints us. Who would suppose that the hard acrid root of the *Brassica Napus*, or common *Rape*, might be rendered so mild and palatable by cultivation, as to be preferred to the common Turnep? yet this has actually been the case, and in France as well as Germany, few great dinners are served up without it in one shape or other.

I am unable to trace its first coming into such common use there; but, as it is distinguished by GASPAR BAUHIN, who published his Pinax, in 1671, it must have been well known at that period. It is called le Navet, by the French; Teltow Rüben, by the Germans; and is the French Turnep of our gardens. The only synonyms I dare put down as certainly belonging to it, are,

Brassica Napus, β. *Linn. Sp. Pl. ed. 2. p.* 931.
Napus Sativa. *G. Bauh. Pin.* 95.

For above twelve years, I have seen this plant brought to the market in Covent Garden, but only by one person, and I believe it has been chiefly sold to foreigners, though, when once known, it will be a very acceptable root in most families. It is much more delicate in flavour than our common Turnep, and is to be used in the same way. In Germany, it enriches all their soups, and there is no necessity to cut away the outer skin or rind, which is thinner than that of the common Turnep, but only to scrape it. Stewed in gravy, it forms a most excellent dish, and, being white, and of the shape of a carrot, when mixed alternately with those roots upon a dish, it is very ornamental. The following different receipts for dressing them, are by an eminent French Cook:

1st. "Take your roots, and wash them very clean with a brush; then scrape them, cutting a thin slice away from the top, and as much from the bottom as will make them all of equal lengths: boil them in water, with a little salt, till they are tender; then put them into a stewpan, with a gill of veal gravy, two tea-spoonfuls of lemon pickle, one of mushroom ketchup, a little mace, and salt, and let them just simmer,

but not boil, for a quarter of an hour ; thicken the gravy with flour and butter, and serve them up hot."

2d. "Take your roots, and after preparing and boiling them as before, put them into a stewpan, with a little water, working in as much flour and butter as will make it as thick as cream; let them simmer five minutes, then place the stewpan near the stove, to keep hot ; just before you dish them, add two large spoonfuls of cream, mixed with the yolk of an egg, and a little mace beat very fine, shaking the pan over the fire for two or three minutes, but do not let them boil ; put white sippets of French bread round the dish."

3d. " Take your largest roots, clean them as before, and cut them in slices as thick as a crown piece ; then fry them till they are of a pale brown colour on both sides ; after which, put them into a stewpan, with as much water as will cover them, to simmer for ten minutes ; then add a large spoonful of Madeira or Xeres wine, the same of browning, a few blades of mace shred, and two tea spoonfuls of lemon pickle ; thicken the liquor with a little flour and butter, and serve them up with toasted sippets round the dish."

One great advantage attending the cultivation of this vegetable is, that it requires no manure whatever ; any soil that is poor and light, especially if sandy, suits it, where it seldom exceeds the size of one's thumb or middle finger ; in rich manured earths it grows much larger, but is not so sweet or good in quality. The season for sowing the principal crop is any time from the middle of July to the end of August, or even later in this country, where our frost seldom sets in before Christmas. If the season should prove dry, it will be necessary to water the beds regularly, till the plants have got three or four leaves, otherwise they will be destroyed by the

fly; this crop will supply the table till April. If wanted during the whole year, a little seed may be sown the latter end of October, and these plants, if they do not miscarry, will be fit for use in April and May. The last crop may be sown from the middle of January to the middle of February, which will also come in the end of May and June, but in July and August they will not be very good, and as at that season of the year, there is an abundance of other vegetables, it is of less consequence: upon a north border, however, and in a sandy moist soil, it is possible to have them sweet and tender during the whole summer.

To save good seeds, you should, in February or the beginning of March, transplant some of the finest roots, placing them two feet asunder, and keeping the ground repeatedly hoed; when the seedpods are formed, they should be guarded from the birds, either with nets, or by shooting some of the birds, and hanging them up upon sticks. As soon as the seedpods change colour, cut the heads, and spread them to dry in the sun, after which beat out the seed, and lay it up for use.

VI. *Observations on the Method of producing new and early Fruits. By* Thomas Andrew Knight, *Esq. F. R. S. &c.*

Read November 4, 1806.

Nature has given to man the means of acquiring those things which constitute the comforts and luxuries of civilized life, though not the things themselves; it has placed the raw material within his reach; but has left the preparation and improvement of it to his own skill and industry. Every plant and animal, adapted to his service, is made susceptible of endless changes, and, as far as relates to his use, of almost endless improvement. Variation is the constant attendant on cultivation, both in the animal and vegetable world; and in each the offspring are constantly seen, in a greater or less degree, to inherit the character of the parents from which they spring.

No experienced gardener can be ignorant that every species of fruit acquires its greatest state of perfection in some peculiar soils and situations, and under some peculiar mode of culture: the selection of a proper soil and situation must therefore be the first object of the improver's pursuit; and nothing should be neglected which can add to the size, or improve the flavour of the fruit from which it is intended to propagate. Due attention to these points will in almost all cases be found to comprehend all that is necessary to insure the introduction of new varieties of fruit, of equal merit with those from which they spring; but the improver, who has to

adapt his productions to the cold and unsteady climate of Britain, has still many difficulties to contend with; he has to combine hardiness, energy of character, and early maturity, with the improvements of high cultivation. Nature has however in some measure, pointed out the path he is to pursue; and, if it be followed with patience and industry, no obstacles will be found, which may not be either removed, or passed over.

If two plants of the Vine, or other tree, of similar habits, or even if obtained from cuttings of the same tree, were placed to vegetate, during several successive seasons, in very different climates: if the one were planted on the banks of the Rhine, and the other on those of the Nile, each would adapt its habits to the climate in which it were placed; and if both were subsequently brought, in early spring, into a climate similar to that of Italy, the plant which had adapted its habits to a cold climate would instantly vegetate, whilst the other would remain perfectly torpid. Precisely the same thing occurs in the hot-houses of this country, where a plant accustomed to the temperature of the open air will vegetate strongly in December, whilst another plant of the same species, and sprung from a cutting of the same original stock, but habituated to the temperature of a stove, remains apparently lifeless. It appears, therefore, that the powers of vegetable life, in plants habituated to cold climates, are more easily brought into action than in those of hot climates; or, in other words, that the plants of cold climates, are most exciteable: and as every quality in plants becomes hereditary, when the causes which first gave existence to those qualities continue to operate; it follows that their seedling offspring have a constant tendency to adapt

their habits to any climate in which art or accident places them.

But the influence of climate on the habits of plants, will depend less on the aggregate quantity of heat in each climate, than on the distribution of it in the different seasons of the year. The aggregate temperature of England, and of those parts of the Russian Empire, that are under the same parallels of latitude, probably does not differ very considerably; but, in the latter, the summers are extremely hot, and the winters intensely cold; and the changes of temperature between the different seasons are sudden and violent. In the spring great degrees of heat suddenly operate on plants which have been long exposed to intense cold, and in which excitability has accumulated during a long period of almost total inaction: and the progress of vegetation is in consequence extremely rapid. In the climate of England, the spring, on the contrary, advances with slow and irregular steps, and only very moderate and slowly-increasing degrees of heat act on plants in which the powers of life have scarcely in any period of the preceding winter been totally inactive. The Crab is a native of both countries, and has adapted alike its habits to both; the Siberian variety introduced into the climate of England, retains its habits, expands its leaves, and blossoms on the first approach of spring, and vegetates strongly in the same temperature in which the native Crab scarcely shows signs of life; and its fruit acquires a degree of maturity, even in the early part of an unfavourable season, which our native Crab is rarely, or never seen to attain.

Similar causes are productive of similar effects on the habits of cultivated annual plants; but these appear most

readily to acquire habits of maturity in warm climates; for it is in the power of the cultivator to commit his seeds to the earth at any season; and the progress of the plants towards maturity will be most rapid, where the climate and soil are most warm. Thus, the Barley grown on sandy soils, in the warmest parts of England, is always found by the Scotch farmer, when introduced into his country, to ripen on his cold hills earlier than his crops of the same kind do, when he uses the seeds of plants, which have passed through several successive generations in his colder climate; and in my own experience, I have found that the crops of Wheat on some very high and cold ground, which I cultivate, ripen much earlier when I obtain my seed-corn from a very warm district and gravelly soil, which lies a few miles distant, than when I employ the seeds of the vicinity.

The value, to the gardener, of an early crop, has attracted his attention to the propagation and culture of the earliest varieties of many species of our esculent plants; but in the improvement of these he is more often indebted to accident than to any plan of systematic culture; and contents himself with merely selecting and propagating from the plant of the earliest habits, which accident throws in his way; without inquiring from what causes those habits have arisen: and few efforts have been made to bring into existence better varieties of those fruits which are not generally propagated from seeds, and which, when so propagated, of necessity exercise, during many years, the patience of the cultivator, before he can hope to see the fruits of his labour.

The attempts which I have made to produce early varieties of fruit are, I believe, all that have yet been made; and

though the result of them is by no means sufficiently decisive to prove the truth of the hypothesis I am endeavouring to establish, or the eligibility of the practice I have adopted, it is amply sufficient to encourage future experiment.

The first species of fruit, which was subjected to experiment by me, was the Apple; some young trees of those varieties of this fruit, from which I wished to propagate, were trained to a south wall, till they produced buds which contained blossoms. Their branches were then, in the succeeding winter, detached from the wall, and removed to as great a distance from it, as the pliability of their stems would permit; and in this situation they remained till their blossoms were so far advanced, in the succeeding spring, as to be in some danger of injury from frost. The branches were then trained to the wall, where every blossom I suffered to remain, soon expanded, and produced fruit. This attained in a few months the most perfect state of maturity; and the seeds afforded plants, which have ripened their fruit very considerably earlier than other trees, which I raised at the same time, from seeds of the same fruit, which had grown in the orchard. In this experiment the fecundation of the blossoms, of each variety, was produced by the farina of another kind; from which process, I think, I obtained, in this, and many similar experiments, an increased vigour and luxuriance of growth; but I have no reasons whatever to think that plants thus generated ripen their fruit earlier than others, which are obtained by the common methods of culture. I must therefore attribute the early maturity of those I have described to the other peculiar

circumstances under which the seeds and fruit ripened, from which they sprang.

I obtained, by the same mode of culture, many new varieties, which are the offspring of the Siberian Crab and the richest of our apples, with the intention of affording fruits for the press, which might ripen well in cold and exposed situations. The plants, thus produced, seem perfectly well calculated, in every respect, to answer the object of the experiment, and possess an extraordinary hardiness and luxuriance of growth. The annual shoots of some of them, from newly grafted trees in my nursery, the soil of which is by no means rich, exceeded six feet and a half in height, in the last season; and their blossoms seem capable of bearing extremely unfavourable weather without injury. In all the preceding experiments some of the new varieties inherited the character of the male, and others of the female, parent in the greatest degree; and of some varieties of fruit (particularly the Golden Pippin) I obtained a better copy, by introducing the farina into the blossom of another apple, than by sowing their own seeds; I sent a new variety (the Downton Pippin) which was thus obtained from the farina of the Golden Pippin, to the Horticultural Society, last year; but those specimens afforded but a very unfavourable sample of it; for the season, and the situation in which the fruit ripened, were very cold, and almost every leaf of the trees had been eaten off by insects. In a favourable season and situation it will, I believe, be found little, if at all, inferior, to the Golden Pippin, when first taken from the tree; but it is a good deal earlier, and probably cannot be preserved so long.

I proceed to experiments on the Grape; which, though less successful than those on the apple, in the production of good varieties, are not less favourable to the preceding conclusions. A vinery in which no fires are made during the winter, affords to the Vine a climate similar to that which the southern parts of Siberia afford to the Apple or Crab Tree: in it a similarly extensive variation of temperature takes place, and the sudden transition from great comparative cold, to excessive heat, is productive of the same rapid progress in the growth of the plants, and advancement of the fruit to maturity. My first attempt was to combine the hardiness of the blossom of the Black Cluster, or Burgundy Grape, with the large berry and early maturity of the true Sweetwater.* The seedling plants produced fruit in my vinery at three or four years old, and the fruit of some of them was very early; but the bunches were short, and ill-formed, and the berries much smaller than those of the Sweetwater, and the blossoms did not set by any means so well as I had hoped.

Substituting the White Chasselas for the Sweetwater, I obtained several varieties, whose blossoms appear perfectly hardy, and capable of setting well in the open air; and the fruit of some of them is ripening a good deal earlier in the present year than that of either of the parent plants. The berries, however, are smaller than those of the Chasselas, and with less tender and delicate skins: and, though not without considerable merits for the desert, they are generally best

* This Grape is often confounded by gardeners, both with the White Chasselas and White Muscadine.

calculated for the press: for the latter purpose, in a cold climate, I am confident that one or two of them possess very great excellence. I sent a bunch of one of those varieties to the Horticultural Society, in the last autumn, and I propose to send two or three others in the present year.

I have subsequently obtained plants from the White Chasselas and Sweetwater, whose appearance is much more promising; and the earliest variety of the Grape I have ever yet seen, sprang from a seed of the Sweetwater, and the farina of the Red Frontignac. This is also a very fine Grape, resembling the Frontignac in colour and form of the bunch; but I fear its blossoms will prove too tender to succeed in the open air in this country; a single bunch, consisting of a few berries, is, however, all that has yet existed of this kind. The present season also affords me two new varieties of the Vine, with striped fruit, and variegated autumnal leaves, produced by the White Chasselas and the farina of the Aleppo Vine: one of these has ripened extremely early, and is, I think, a good Grape. When perfectly ripe, I propose sending a bunch of it for the inspection of the Horticultural Society.

In all attempts to obtain new varieties of fruit, the propagator is at a loss to know what kinds are best calculated to answer his purpose; and therefore, I have mentioned those varieties of the Grape, from which I have propagated with the best prospect of success. My experiments are, however, still in their infancy; and I do not possess the means of making them on so large a scale, or in so perfect a manner as I wish; nevertheless, the facts of which I am in possession, leave no grounds of doubt in my mind, that varieties of the

Grape, capable of ripening perfectly in our climate, when trained to a south wall, and of other fruits better calculated for our climate than those we now cultivate, may readily be obtained; but whether the mode of culture I have adopted and recommended be the most eligible must be decided by future and more extensive practice.

I have made experiments similar to the preceding, on the Peach; but I can say no more of the result of them, than that the plants possess the most perfect degree of health and luxuriance of growth, and that their leaves afford satisfactory evidence of the good quality of the future fruit. I am ignorant of the age at which plants of this species become capable of producing blossoms; but the rapid changes in the character of the leaves and growth of my plants, which are now in their third year, induces me to believe, that they will be capable of producing fruit at three or four years old.

I shall finish my paper with stating a few conclusions, which I have been able to draw in the course of many years close attention to the subject on which I write.

New varieties of every species of fruit will generally be better obtained by introducing the farina of one variety of fruit into the blossom of another, than by propagating from any single kind. When an experiment of this kind is made, between varieties of different size and character, the farina of the smaller kind should be introduced into the blossoms of the larger; for, under these circumstances, I have generally (but with some exceptions) observed in the new fruit a prevalence of the character of the female parent; probably owing to the following causes. The seed-coats are generated wholly

by the female parent, and these regulate the bulk of the lobes and plantule: and I have observed, in raising new varieties of the Peach, that when one stone contained two seeds, the plants these afforded were inferior to others. The largest seeds, obtained from the finest fruit, and from that which ripens most perfectly and most early, should always be selected. It is scarcely necessary to inform the experienced gardener, that it will be necessary to extract the stamina of the blossoms from which he proposes to propagate, some days before the farina begins to shed, when he proposes to generate new varieties in the manner I have recommended. When young trees have sprung from the seed, a certain period must elapse before they become capable of bearing fruit, and this period, I believe, cannot be shortened by any means. Pruning and transplanting are both injurious; and no change in the character or merits of the future fruit can be effected, during this period, either by manure or culture. The young plants should be suffered to extend their branches in every direction, in which they do not injuriously interfere with each other; and the soil should just be sufficiently rich to promote a moderate degree of growth, without stimulating the plant to preternatural exertion, which always induces disease.* The periods which different kinds of fruit trees require to attain the age of puberty, are very varied. The Pear requires from twelve to eighteen years; the Apple, from five to twelve, or thirteen; the Plum and Cherry, four or five years, and the Vine three or four; and the Raspberry, two years. The Strawberry, if its seeds be

* The soil of an old garden is peculiarly destructive.

sown early, affords an abundant crop in the succeeding year. My garden at present contains several new and excellent varieties of this fruit,* some of which I shall be happy to send to the Horticultural Society.

* The Hautboy Strawberry does not appear to propagate readily with the other varieties, and may possibly belong to an originally distinct species. I have, however, obtained several offspring from its farina; but they have all produced a feeble and abortive blossom. If nature, in any instance, permits the existence of vegetable mules (but this I am not inclined to believe) these plants seem to be beings of that kind.

VII. *On the Cultivation of the* Polianthes Tuberosa, *or* Tuberose; *with its Botanical Description and Figure. By* Richard Anthony Salisbury, *Esq. F. R. S. &c.*

Read December 2, 1806.

The charms of Horticulture, in every civilized nation, have been acknowledged by men of all ranks, from the highest prince down to the lowest cottager. While the graver duty of the historian has been simply to commemorate the calm and innocent delights which it affords, the holy mythologist has exalted it as the sole employment of our first parents in paradise; and poets have embellished their most enchanting verses with its productions; so that to offer a long and laboured panegyric upon any single branch of it, to a Society instituted for the express purpose of encouraging them all, would, in the emphatic language of an old writer, be like vainly attempting to paint the lily, add a perfume to the violet, or gild refined gold. The field before us, moreover, is no less extensive than that of the whole globe, which is in fact one immense garden, covered with vegetables common to every animal that exists; but Providence has in infinite wisdom allotted to man, the proud pre-eminence over all; his wants, if he is not indolent, being invariably first supplied. In those earlier stages of society, however, when the ground was first cultivated, it must have been inconceivably difficult to exclude various animals both carnivorous and herbivorous, from the immediate precincts of human habitations; driven as they now are from

every populous country, we can form but a very imperfect idea of their tremendous power and strength in warmer climates, while thinly inhabited. Hence the progress, even of Agriculture, was in all probability for a long period slow and interrupted : years and years must have elapsed, before her younger and more delicate sister, Horticulture, ventured to appear ; though, to plant a clump of Bananas, which would give immediate shade, and to perfume the surrounding air with the fragrance of an Orange grove, independent of the fruit these two vegetables afford, must have been natural, one would think, to many a savage of finer feelings, the moment his residence became fixed.

To leave the language of fancy for that of fact, I know no ornamental plant, which seems to me more deserving of cultivation in the warmer soils of this kingdom, or that would repay the labour attending it with greater profits, than the *Tuberose*. Its botanical description is as follows :

ORDO NATURALIS.

Agaveæ : post *Doryanthem.*

Polianthes. L. J. Pericarpium fere totum inferum, 3-loculare, demum crustaceum. Corollæ Tubus longus, juxta basin curvus, infundibuliformis : Limbus parum irregularis, profunde 6-fidus. Filamenta brevissima, ore tubi inserta, subulata. Antheræ longæ, post anthesin recurvæ et parum incumbentes. Semina plurima, 2-plici serie inserta, complanata. *Herba*, 4-5 *pedes alta. Radix Oblonga tuberosa, fibris carnosis multiceps. Folia Radicalia, facie aliquâ* Hyacinthi Orientalis, *subcarnosa. Flores nocte fragrantissimi, spicâ longa paribus alterni, subsessiles. Bractea solitaria sub*

singulis floribus præter 3-*tiam communem et alias inferius sparsas. Proculdubio recte inseruit* Adanson *juxta* Agavem.

P. *(Tuberosa)* foliis lineari attenuatis obtuse mucronatis.

Variat α: flore simplici.

P. Tuberosa *Redout. Pl. Lil.* p. 147. *cum Ic.* malâ pro nostro ævo. (1805). Polianthes Tuberosa. *Fl. Per.* v. 3. p. 66. (1802). P. Tuberosa *Lam. Illustr.* t. 243. (1793). Polianthes Tuberosa. *Lour. Fl.Coch.*v.1.p.204. (1790). P. floribus, &c. *Knorr. Del.* 1. t.T.12. (1767). P. Tuberosa. *Kniph. Cent.* 12. n. 76. (1764). Pothos. *Adans. Fam.* v. 2. p. 57. (1763). P.Tuberosa. *Linn. Sp. Pl. ed.* 2. p. 453. (1762). P. floribus, &c. *Linn. Fl. Zeyl.* p.52.(1748). Amica nocturna. *Rumph. Herb. Amb.*v. 5. p. 285. t. 99. (1740). P. floribus, &c. *Linn. Hort. Cliff.* p. 127. (1737). Hyacinthus Indicus, &c. *Burm. Thes. Zeyl.* p. 122. (1737). Hyacinthus Tuberosus, &c. *Mill. Gard. Dict. ed.* 1. n. 1. (1731). Hyacinthus Tuberosus. *Boerh. Hort. Lugd.*v. 2.p.114. (1720). Sandal Malam. *Herm. Zeyl.* p. 35. (1720). Hyacinthus Indicus, &c. *Tournef.Inst.* p.347.(1719). Hyacinthus Indicus Tuberosus. *Camell. Syll.* p. 0. *in Ray Hist. Pl.* v. 3. (1704). Hyacinthus ille Indicus, &c. *Plum. Gen.* p. 35. *lin.* 24. (1703). Hyacinthus Indicus, &c. *Rudb.Camp. Elys.* 2. p. 39. f. 2. *et* 4. (1701). Hyacinthus Indicus minor, &c. *Ray Hist. Pl.* v. 2. p. 1164. Hyacinthus Indicus major, &c. *Ray Hist. Pl.* v. 2. p. 1164. (1693). Hyacinthus Indicus, &c. *Moris. Hist.* v. 2. p. 326. *sect.* 4. t.12. f. 22. (1680). Hyacinthus Indicus, &c. flore narcissi. *C.Bauh. Pin.* p. 47. Hyacinthus Indicus, &c. *C. Bauh. Pin.* p. 47. (1671). Hyacinthus Indicus major, &c. *Park. Par.* p. 111. *cum. fig.* e Vallèt pessime conflatâ. Hyacinthus

basi 2-fidâ, apice emarginatæ, 2-loculares, 4-valves, versus faciem dehiscentes; post anthesin apice recurvulæ et parum incumbentes. Pollen flavum. Stylus albus, longitudine tubi, linearis, 3-angulus, glaber. Stigma album, 3-lobum lobis recurvo-horizontalibus ovalibus emarginatis, intus præcipue ad marginem viscido-pubescentibus.

The first account that I find of the *Tuberose*, is in L'Ecluse's History of Plants, where it appears that on the 1st of *December*, 1594, he received a specimen of it, in very bad condition, from Bernard Paludanus, a Physician at Ronie, to whom it was sent by the celebrated Simon de Tovar, of Seville. It certainly had not then been many years in Europe, and Linnæus in his *Hortus Cliffortianus*, on this head refers us to Plumier's *Genera Plantarum*, p. 35, who says it was first brought by Father Minuti, from the East Indies, into the senator Peiresc's garden at Boisgencier, near Toulon. It is much more probable, however, that it was introduced at an earlier period, and from America, for no author describes it as wild in the East Indies; Loureiro only found it cultivated in the gardens of Cochin China, and Rumph says it was unknown in the Island of Amboina, till the Dutch carried it there from Batavia, in 1674. On the contrary, Kamel informs us, that it was brought to the Island of Luzone, by the Spaniards, from Mexico: and Parkinson, in 1656, tells us, that the plants, which he describes as two species, "both grow naturally in the West Indies, from whence being first brought into Spain, have from thence been dispersed unto divers lovers of plants." The senator Peiresc, as may be learnt from Gassendi, was only fourteen years old in 1594, when Simon de Tovar

had already cultivated it at Seville, and according to REDOUTÈ, it was not planted in his garden at Boisgencier, by FATHER MINUTI, till 1652, whom that author makes to have brought it from Persia: I only infer, however, that he travelled from Hindostan over land. REDOUTÈ, moreover asserts, that the authors of the *Flora Peruviana* found it wild in America, but in the work itself they say, cultivated in gardens. The evidence of HERNANDEZ, however, I think, takes away all doubt about the matter; he says, "provenit in frigidis et temperatis regionibus, veteri incognita mundo," and as the Agave, to which the Tuberose is more immediately allied, is also a native of Mexico, I am fully of opinion that it is indigenous there.

The description given by the venerable L'ECLUSE, of his specimen, half dried and battered by the journey, with only the lowest flower of the spike expanded, affords a memorable instance of his accuracy and discernment. The size of the stem, insertion and figure of the leaves, and their hempy texture, are particularly noticed; the shape of the corolla, with its general similarity to that of the Asiatic Hyacinth, but in consistence rather to that of the Orange, is next remarked; and having no knowledge of the root to guide his judgment, but what he derived from SIMON DE TOVAR'S appellation of *Bulbus Indicus florem album proferens Hyacinthi Orientalis æmulum*, he guesses it may possibly belong to the same genus with the *Bulbus eriophorus*, or *Peruvian Hyacinth*, though not without some doubts raised by its stem being covered with leaves, and its tubular corolla. Two years afterwards, these doubts were corroborated by his receiving roots both from SIMON DE TOVAR, and the COMTE D'AREMBERG, which by August were full of leaves; and I think it worth

noticing, that his figure of the plant appears evidently to have been made up from the original specimen sent by BERNARD PALUDANUS, and one of those growing roots, which he expressly mentions did not flower; he concludes with observing, that if it is still to remain in the genus, it may be called *Hyacinthus Indicus tuberosâ radice.*

From this Latin phrase, no doubt, our silly appellation of *Tuberose*, and the more accurate French name, *Tubereuse*, originated; but in the East Indies it is distinguished by the poetical title of *Sandal Malam*, or *Intriguer of the night;* in Spain, where at the period of this plant's being discovered it was the fashion to give both places and things religious names, it is called *Vara de S. Josef.*

Soon after L'ECLUSE's figure, an excellent one by VALLÈT the embroiderer came out at Paris in 1608, and both these were copied and published as different species by SWERTIUS in his Florilegium. An original figure, which has great merit for that day, though not equal to VALLÈT's, next appeared in the Theatrum Floræ, my edition of which, I believe the earliest, bears the date of 1622; it shows many roots flowering in one pot. From FERRARIUS' pompous book on the culture of flowers, we learn it was still regarded as a rarity in the Barberini gardens, at Rome, in 1633, but that it increased abundantly, and was taken out of the ground every year in March, to separate the offsets. Our countryman PARKINSON, more than half a century after its being first described by L'ECLUSE, is the next author who treats of this plant; but valuable as many of his quaint observations still are to the Horticulturist, his account of the Tuberose does him little credit; he makes two species of it, saying he thinks L'ECLUSE never saw the first, though he owns "some do doubt that they are not two

plants several as of greater and lesser, but that the greatness is caused by the fertility of the soil;" his figures are wretchedly copied from SWERTIUS, and by his calling it the Indian knobbed Jacinth, it appears not to have been known here then by its modern name. GASPAR BAUHIN, with his usual carelessness, also takes it up as two species from SWERTIUS, and even the learned RAY seems to have known as little about it in 1693, adding, however, to his second species, the title of Tuberose.

I meet with nothing more of any consequence respecting it, till PHILIP MILLER, the pride of every British gardener, published the first edition of his Dictionary in 1731. He makes it a distinct genus from Hyacinthus, and describes the variety with double flowers, now so common, but then only to be seen in MONSIEUR DE LA COURT's garden near Leyden, whose memory is most justly consigned to infamy by our author, for destroying many hundreds of the roots, rather than part with a single one to any other person; an instance of narrowness of mind and ill nature, he adds, too common among the lovers of gardening. I trust no one who belongs to this Society will ever deserve a similar reproach. At this period we find the roots were annually imported into England, along with Orange trees and Myrtles from Genoa, and to the directions there given for blowing them, so as to have a succession of flowers from June till October, nothing can be added.

Though our gardens now are enriched with a profusion of other fragrant and beautiful flowers, the Tuberose still continues to maintain its superiority, and we receive roots, especially of the double variety, from the warmer provinces of

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1897.

North America, as well as Italy. There is no necessity, however, to be indebted to foreign countries for this supply, and I can speak from experience, having cultivated it in the open air for many years at Chapel Allerton, notwithstanding the average temperature of that hill from the month of April to October is far lower than in the adjacent valley. If a sufficient degree of heat in summer can only be obtained to bring the leaves out to their full magnitude, that of the roots follows of course, and very little more care than what is bestowed upon the Artichoke, will preserve them from the severest frosts.

For this purpose, select a piece of ground perfectly well drained, either under a south wall, or defended on the north by a reed hedge. The size of the bed must be proportioned to the number of roots wanted, for the same bulb never blows a second time; the lateral ones, which are produced in great abundance, supplying the new stock. As the roots must be at five inches distance from each other, a bed nine feet long by three feet wide, will hold 144. The soil which I have found them succeed best in, is light sandy earth, mixed with a third part of very rotten cow dung; the earth should be taken about seven or eight inches deep, along with the green turf, chopping it very small with the spade, and turning it once a month for a year before it is used; if the earth is not very light, add a quantity of sea sand, or fine shelly gravel. If you are obliged to use this compost sooner, pass it through a wide screen, casting out nothing but any large stones. About the middle of April prepare the bed as follows: first, take out all the old earth, to the depth of two feet and a half, or three feet, filling it nearly to the top with fresh stable dung, that has been cast

into a heap to heat a fortnight before: lay the dung evenly in the trench, treading each layer very firmly down with a board under your feet, and reserving the smallest and shortest for the last: upon this lay eighteen inches in depth of the compost, sloping it well towards the south, not only for the benefit of the sun, but to throw off violent rains. In a day or two after, plant your roots at five inches distance from each other, observing to place them alternately in the rows, and that the crown or upper part of the tuber is only just covered with earth. These should be the offsets of such as after flowering the preceding year have been preserved from frost through the winter in sand, as well as the strongest remaining upon any fresh imported ones: till you obtain a sufficient stock even the weakest may be planted, but as a great number are annually produced by every root, in time those which are large enough to flower the following year need only be selected. Cover the bed at night, especially if frosty, with a double mat, till the leaves appear, but give little or no water, protecting it carefully from heavy rains. When the leaves are about an inch long, add a little fresh compost to the surface, filling up any inequalities, and removing all weeds. If the season prove dry, it will now require watering, and towards the end of June and in July when the leaves are in full vigour, very copiously; but this must depend upon the weather. From this period till the beginning of winter, nothing more is necessary than to weed the bed, and protect it from the autumnal rains: this may be done by sloping the ground more up to it, or if you have a cucumber frame not in use, it may be employed for this purpose, taking care to sink the front so low as to admit all the sun possible. About the first week in

December, take the advantage of a dry day, and after clearing away all the decayed leaves, thatch the bed all over, and at the sides, a foot thick with dry straw, sloping it well to throw off the wet. About the middle of February, if not prevented by severe frost, take up all the roots preserving their fibres, and pack them in very dry sand, in cellars where the cold cannot penetrate, till April, when they must be replanted as before, shortening their fibres more or less, as you find them decayed.—If the climate was even milder than ours, I should recommend the roots to be taken out of the ground, and preserved in dry sand, for by this means they are thrown into a complete state of rest, and disposed to form their flower stems earlier. By February many offsets will have made their appearance round each root, all of which, except two or three at most of the strongest, should be cut entirely out, and this operation must be in some degree repeated after they are planted and growing, as fresh offsets are produced; for, if permitted to remain, they will rob the other buds of sufficient nourishment. This second year some of the largest roots will probably flower: if they send up their stems early, it will only be necessary to stick them carefully, when about a foot and a half high, and leave them to blossom in the open air; but when they appear later than July, they should either be removed into pots, with a trowel, preserving all the fibres possible, and placed in a stove, or, if you have not that convenience, cut out the flower stem, with all the central leaves, as soon as it is discovered, which will strengthen the offsets. In the succeeding winter thatch the bed, taking up the roots in February, as before, most of which will now be strong enough to flower, and may be selected for sale: such roots, if wanted for early forcing,

will have a decided advantage over imported ones, for, as their fibres will not be entirely decayed, they will push immediately upon being removed into brisk heat, and may be brought to flower as early as May.

According to the above-mentioned distances, half a quarter of an acre would contain 15,125 roots, leaving nearly as much space, for the alleys as the beds, which, at 3*d.* each, amounts to the sum of £189. 1*s.* 6*d.* and as, when a sufficient stock of offsets, to select the largest, was obtained, the annual return of blowing roots may be estimated at half the number planted, the profits of a bed of Tuberoses, after deducting every expense of rent, dung, and labour, would be considerable, even if it were necessary to cover it in autumn and winter with frame lights. There are many places in our Island where I should imagine this plant might be cultivated with still less care and attention, especially in the southern counties near the sea; in the vicinity of London, Ham Common, Sunbury, and Walton upon Thames; in the Isle of Wight; about Southampton; below Exeter; near Bath and King's Weston; in South Wales: and the theory which I would recommend any intelligent gardener to adopt in its general management is, to keep the roots growing as vigorously as possible from May to October, but in a state of complete rest and drought for the remainder of the year.

VIII. *On the Revival of an Obsolete* Mode of Managing Strawberries. *Communicated by the Right Hon. Sir* JOSEPH BANKS, *Bart. K. B. P. R. S. &c.*

Read December 2, 1806.

THE custom of laying straw under *Strawberry Plants*, when their fruit begins to swell, is probably very old in this country: the name of the fruit bears testimony in favour of this conjecture, for the plant has no relation to straw in any other way, and no other European language applies the idea of straw in any shape to the name of the berry, or to the plant that bears it.

When Sir JOSEPH BANKS came to Spring Grove, in 1779, he found this practice in the garden; JOHN SMITH, the gardener, well known among his brethren as a man of more than ordinary abilities in the profession, had used it there many years; he learned it soon after he came to London from Scotland; probably at the Neat Houses, where he first worked among the market gardeners; it is therefore clearly an old practice, though now almost obsolete.

Its use in preserving a crop is very extensive; it shades the roots from the sun; prevents the waste of moisture by evaporation, and consequently, in dry times, when watering is necessary, makes a less quantity of water suffice than would be used if the sun could act immediately on the surface of the mould; besides, it keeps the leaning fruit from resting on the earth, and gives the whole an air of neatness as well

as an effect of real cleanliness, which should never be wanting in a gentleman's garden.

The Strawberry beds in the garden at Spring Grove which have been measured for the purpose of ascertaining the expense incurred by this method of management, are about 75 feet long, and five feet wide, each containing three rows of plants, and of course requiring four rows of straw to be laid under them. The whole consists of 600 feet of beds, or 1800 feet of Strawberry Plants, of different sorts, in rows. The strawing of these beds consumed this year, 1806, the long straw of 26 trusses, for the short straw being as good for litter, as the long straw, but less applicable to this use, is taken out; if we allow then on the original 26 trusses, six for the short straw taken out and applied to other uses, 20 trusses will remain, which cost this year 10*d*. a truss, or 16*s*. 8*d*. being one penny for every nine feet of Strawberries in rows.

From this original expenditure the value of the manure made by the straw when taken from the beds must be deducted, as the whole of it goes undiminished to the dunghill as soon as the crop is over. The cost of this practice therefore cannot be considered as heavy; in the present year not a single shower fell at Spring Grove, from the time the straw was laid down till the crop of Scarlets was nearly finished, at the end of June. The expense of strawing was therefore many times repaid by the saving made in the labour of watering, and the profit of this saving was immediately brought to account in increase of other crops, by the use of water spared from the Strawberries, and besides, the berries themselves were, under this management, as fair and nearly as large as in ordinary years; but the general complaint of the

gardeners this year was, that the Scarlets did not reach half their natural size, and of course required twice as many to fill a pottle as would do it in a good year.

In wet years the straw is of less importance in this point of view, but in years moderately wet, the use of strawing sometimes makes watering wholly unnecessary, when gardeners who do not straw are under the necessity of resorting to it, and we all know if watering is once begun, it cannot be left off till rain enough has fallen to give the ground a thorough soaking.

Even in wet years the straw does considerable service, heavy rains never fail to dash up abundance of mould, and fix it upon the berries, this is entirely prevented, as well as the dirtiness of those berries that lean down upon the earth, so that the whole crop is kept pure and clean: no earthy taste will be observed in eating the fruit that has been strawed, and the cream, which is sometimes soiled when mixed with Strawberries, by the dirt that adheres to them, especially in the early part of the season, will retain to the last drop that unsullied red and white which gives almost as much satisfaction to the eye while we are eating it, as the taste of that most excellent mixture does to the palate.

IX. *On raising new and early Varieties of the* Potatoe. *By* Thomas Andrew Knight, *Esq. F. R. S. &c.*

Read January 6, 1807.

THE *Potatoe* contributes to afford food to so large a portion of the inhabitants of this country, that every improvement in its culture becomes an object of national importance; and thence I am induced to hope that the following communication may not be unacceptable to the Horticultural Society.

Every person who has cultivated early varieties of this plant, must have observed, that they never afford seeds, nor even blossoms; and that the only method of propagating them is by dividing their tuberous roots: and experience has sufficiently proved, that each variety, when it has been long propagated, loses gradually some of those good qualities, which it possessed in the earlier stages of its existence. Dr. HUNTER, in his *Georgical Essays*, I think, has limited the duration of a variety, in a state of perfection, to about fourteen years; and probably, taking varieties in the aggregate, and as the plant is generally cultivated, he is nearly accurate. A good new variety of an early Potatoe is therefore considered a valuable acquisition by the person who has the good fortune to have raised it; and as an early variety, according to any mode of culture at present practised, can

only be obtained by accident from seeds of late kinds, one is not very frequently produced: but by the method I have to communicate, seeds are readily obtained from the earliest and best varieties: and the seeds of these, in successive generations, may, not improbably, ultimately afford much earlier and better varieties, than have yet existed.

I suspected the cause of the constant failure of the early Potatoe to produce seeds, to be the preternaturally early formation of the tuberous root; which draws off, for its support, that portion of the sap, which, in other plants of the same species, affords nutriment to the blossoms and seeds: and experiment soon satisfied me that my conjectures were perfectly well founded.

I took several methods of placing the plants to grow, in such a situation, as enabled me readily to prevent the formation of tuberous roots; but the following appearing the best, it is unnecessary to trouble the Society with an account of any other.

Having fixed strong stakes in the ground, I raised the mould in a heap round their bases, and in contact with them: on their south sides I planted the Potatoes from which I wished to obtain seeds. When the young plants were about four inches high, they were secured to the stakes with shreds and nails, and the mould was then washed away, by a strong current of water, from the bases of their stems, so that the fibrous roots only, of the plants, entered into the soil. The fibrous roots of the Potatoe are perfectly distinct organs from the runners, which give existence, and subsequently convey nutriment, to the tuberous roots; and as the runners spring from the stems only of the plants,

which are, in the mode of culture I have described, placed wholly out of the soil, the formation of tuberous roots is easily prevented; and whenever this is done, numerous blossoms will soon appear, and almost every blossom will afford fruit and seeds. It appears not improbable, that, by introducing the farina of the small, and very early varieties into the blossoms of those of larger size, and somewhat later habits, moderately early varieties, adapted to field culture, and winter use, may be obtained; and the value of these to the farmer in the colder parts of the kingdom, whose crop of Potatoes is succeeded by one of Wheat, would be very great. I have not yet made any experiment of this kind; but I am prepared to do it in the present spring.

X. *On the Advantage of* Grafting *Walnut, Mulberry, and Chestnut Trees. By* Thomas Andrew Knight, Esq. *F. R. S. &c.*

Read January 6, 1807.

In the course of very extensive experience in the propagation of Apple and Pear Trees, I found that the detached parts of the bearing branches of old trees of those species, when employed as grafts, never formed what could with propriety be called young trees; the stocks appeared to afford nutriment only; and the new plants retained, in all instances, the character and habits of the bearing branches of which they once formed parts; and generally produced fruit the second or third year after the grafts had been inserted.*

I was therefore induced to hope that the effects of time might be anticipated in the culture of several fruits, the trees of which remain unproductive during many years after they are planted; and that parts of the bearing branches of those detached from the old trees, and employed as grafts, would still retain the character and habits of bearing branches.

Having therefore planted in the spring of 1799, some

* Columella appears to have known that a cutting of a bearing branch did not form a young tree; for, speaking of cuttings of the Vine (semina) he says, "optima habentur a Lumbis; secunda ab Humeris; tertia summa in Vite lecta, quæ celerrime comprehendunt, et sunt feraciora, sed et quam celerrime senescunt." *De Arboribus, chap.* 3.

Walnut Trees, of two years old, in garden pots, I raised them up to the bearing branches of an old Walnut Tree, by placing them on the top of poles placed in the earth; and I grafted them, by approach, with parts of the bearing branches of the old tree. An union took place during the summer, and in the autumn the grafts were detached from the parent stock. The plants thus obtained were planted in a nursery, and, without any peculiar care or management, produced both male and female blossoms in the third succeeding spring, and have since afforded blossoms every season. The frost has, however, rendered their blossoms, as well as those of other trees in their vicinity, wholly unproductive during the last three years, and in the spring of 1805, almost wholly destroyed the wood of the preceding year. A similar experiment was made in the same year, but under many disadvantages, on the Mulberry Tree. I had not any young plants of this tree, and therefore could only make the experiment with scions of one year old; and of these I had only two, which had sprung from the roots of a young tree, in the preceding year. These were planted in pots, and raised to the bearing branches of an old tree, in the manner I have already described in speaking of the Walnut Tree. One of these scions died; the other, which had but very few roots, succeeded; and the young grafted tree bore fruit the third year, and has continued annually productive. In the last spring I introduced it into my Vinery, where its fruit ripened, in the greatest state of perfection, in the beginning of June.

Both the Walnut and Mulberry Tree succeed so ill when grafted, unless by approach, that I can scarcely recommend attempts to propagate them in any other way; but when they

do succeed by other modes of grafting, nearly the same advantages will probably be obtained: the habit of the bearing branch is, however, least disturbed by grafting by approach.

The Spanish Chestnut succeeds readily when grafted in almost any of the usual ways, and when the grafts are taken from bearing branches, the young trees afford blossoms in the succeeding year: and I am much inclined to think, from experiments I have made on this tree, that by selecting those varieties which ripen their fruit early in the autumn, and by propagating with grafts or buds from young and vigorous trees of that kind, which have just attained the age necessary to enable them to bear fruit, it might be cultivated with much advantage in this country, both for its fruit and timber.

I have tried similar experiments on many other species of trees, and always with the same result; and I entertain no doubt that the effects of time might be thus anticipated in the culture of any fruit which is not produced till the seedling trees acquire a considerable age. For I am thoroughly confident, from very extensive and long experience, that the graft derives nutriment only, and not youth, from the young stock in which it is inserted; and that with the life of the parent stock, the graft retains its habit and its constitution.

XI. *An Account of some* New Apples, *which, with many others that have been long cultivated, were exhibited before the Horticultural Society, the second of December,* 1806. *By Mr.* Arthur Biggs, *F. H. S. Gardener to* Isaac Swainson, *Esq. at Twickenham, in Middlesex.*

Read February 3, 1807.

Of all the different fruits that our island affords, none can be brought to a higher degree of perfection, with so little care and trouble, especially in its southern counties, as the *Apple*. For a proof of this, I hope it will not be deemed presumptuous in me to refer to the catalogue below, every variety of which I had the honour of exhibiting to the Horticultural Society, at our meeting in December last. Having been flattered by the wishes of many gentlemen then present, to give some account of such as are new, and by what culture they have been produced in such perfection, I cannot but attempt it, though very inadequate to the task, for almost every hour of my life has been employed in following the instructions of others, and when I have deviated from them, with a view to improvement, I have seldom been able to write down the result of my experiments with any satisfaction to myself.

Besides the sorts of Apples lately exhibited, the garden of my indulgent master, contains a number of others which are less valuable. When I mention that I am cutting these away as the better trees advance, and thinning the branches of the latter also as they require it, I perhaps tell all that is to be told upon the subject; for I have found nothing of

more consequence to the health of the Apple Tree than plenty of light and air. The instructions of the late Mr. PHILIP MILLER, on this head, are so pointed, and I see so many Apple Trees smothered either by their own branches or those of other trees, that I cannot do better than quote his words. After directing the standard trees to be planted at the distance of forty feet every way, and the dwarfs at that of twenty feet, he says, "I am aware how many enemies I shall raise by retrenching the great demand which must of necessity be made in the several nurseries of England, if this practice be adopted, but as I deliver my sentiments freely on every article, aiming at nothing more than the information of my readers, so I hope there will be found none of my profession of such mercenary tempers as to condemn me for telling truth, though it may not always agree with their interests."

I feel no fear in referring to this great gardener's work, because all the principal Nurserymen, who now supply the public in the vicinity of London, are men of too much liberality to recommend a less distance, than the above; and in the present opulent state of this country, the original price of the trees is comparatively so trifling, that if any one plants double the number which ought to remain, he will be repaid more than a hundred fold, in the few years, that the alternate trees are suffered to stand. This is a practice, therefore, which I have not scrupled to recommend; but, after all, whether a gentleman plants many or few trees, his future success and gratification depend principally upon the judgment of his gardener, in choosing such trees in the nursery, as have been grafted from *bearing branches;* and if I thought myself authorised to give any hints to our Nurserymen, it would be

relative to the selection of their grafts and buds, not only in the Apple Tree, but in every sort of Fruit Tree, about which they are in general too careless.

I must now observe, that the Apple Tree will grow readily by cuttings, and that trees raised in this way, from healthy one-year old branches, with blossom buds upon them, will continue to go on bearing the very finest possible fruit, in a small compass, for many years. Such trees are peculiarly proper for forcing, by way of curiosity or luxury, and I believe that they are less liable to canker than when raised by grafting, though I am unable to assign any reason for it. I have more than once experienced this in the Golden Pippin, cuttings of which have remained seven years in perfect health, when grafts taken not only from the same tree, but from the very branch, part of which was divided into cuttings, cankered in two or three years. Accident, which brings to light so many useful things, first taught me this practice; some cuttings that I had stuck into the ground for marks of annual flowers, having all made roots. The soil was loamy, and the summer proved so wet and cold, that many bunches of Grapes in a large greenhouse, which I could not prevail upon the gentleman I then served to be at the expense of thinning with scissars, rotted when green.

The soil at Twickenham is light, and inclined to sand rather than loam, in which the Apple Tree will ripen its fruit earlier and more completely than in a stiffer soil, but it will not last so long. Young seedling plants will also produce their blossoms and fruits in a shorter period in such soil. The trees being originally placed too near each other, I have transplanted several into other quarters with very great success,

even after they had attained a considerable magnitude. In doing this, I was careful to preserve every root possible, both great and small, and to have the ground where they were to be planted ready open to receive them, so that their roots were only exposed to the air a few minutes ; their fibres were disposed as horizontally as possible, and not too deep. The months of September and October should be preferred for transplanting any large tree, watering it well if showers do not fall the same day : if the leaves are not pulled off, it will make fresh roots immediately, or at all events be more disposed to push them forth in spring. I constantly tread the ground exceeding firmly with my feet, in separate layers of about an inch, so as to render staking unnecessary, a practice which, if performed so as to have any real effect, is very expensive, but which too frequently does more mischief than good.

Of the varieties of the Apple cultivated in Mr. Swainson's garden, which ripen early, I can especially recommend,

The Summer Pippin.
Devonshire Quarenden.
Summer Traveller.
Bland Rose.
Summer Pearmain.
Red Calville.
Marigold.
Kirke's Incomparable.
Evans's Valuable.
Nonsuch.

Of the autumn and winter varieties, perhaps all those which follow are valuable, especially such as are marked with a star, and those marked with a cross are new. Speci-

mens of one of the smaller as well as larger of each, formed the assortment lately exhibited.

* Norfolk Storer.
* Norfolk Beaufin.
Norfolk Paradise.
Holland Pippin.
Embroidered Pippin.
Striped Holland Pippin.
* Lemon Pippin: as this variety is beginning to canker in many gardens, there is no doubt that it is old, and has been introduced from the continent, probably Normandy; for a gentleman who was at Rouen, during the last short peace, saw it there in abundance.
* Ribston Pippin.
Newtown Pippin.
* Golden Pippin.
Marmail Pippin.
French Pippin.
Kirton Pippin.
Wyken Pippin.
Fearn's Pippin.
London Pippin.
* Kentish Pippin.
Newtown late Pippin.
Mathematic Pippin.
† Williams's Pippin.
Whitmore's Pippin.
New York Pippin.
Raspberry Pippin.
* Cat's Head Apple.

* King of Pippins.
Nonpareil Codling.
Cowring's Queening.
* Flower of Kent.
Sellewood's Reinette.
* Hollandbury.
Golden Mundi.
Margill.
Nutmeg Apple.
Royal Russet.
Golden Russet.
Pile's Russet.
Clifton's Crab.
* Minchull Crab.
French Crab.
Herefordshire Pearmain.
Loan's Pearmain.
Holt's Pearmain.
Kentish Reinette.
Lady's Thigh.
Pigeon's Egg.
Tolworth Court.
Spice Apple.
Quince Apple.
Hall Door.
* Transparent Pippin.
* Golden Reinette.
Golden Royal.
† Biggs's Nonsuch.
† Flat Green.

† False Beaufin.
Summer Breeding.
Court-pendu.
† Minier's Dumpling.
† Padley's Pippin.
† Oval Apple.
† Green Pyramid.

To give a complete history of each of the New Apples above mentioned is out of my power: they have all been raised by other gardeners, from whom we may rather expect it: in the mean while, however, the following descriptions will perhaps suffice to make those which appear to me the best, more known.

Williams's Pippin. Size, from two inches to two inches and a half long. Colour, pale yellow, with a little red on the sunny side, and here and there a spot. Shape, somewhat conical, scarcely longer than broad, deeply umbilicated at the stalk which is short, hollow at the top; the leaflets of the calyx, though black and dry, still remaining more perfect than in many. Flesh, pale yellow, soft, excellent to eat ripe from the tree, baking and roasting well till Christmas.

Padley's Pippin. Size, from two to three inches in length. Colour, rich yellow, generally very finely laced all over with a pale rough starry bark, if I may use the term. Shape, oval, about the stalk flat, or often a little prominent on one side, not much depressed about the calyx, which is more obliterated than in many others, perhaps from that circumstance. Flesh, firm and juicy, of a rich perfumed and poignant flavour, in high perfection all December and January. I am inclined to think this the very best of our new Apples.

Biggs's Nonsuch. Size, from two to three inches in length. Colour, deep yellow, striped and variegated with red on the sunny side. Shape, and general appearance somewhat like the Nonsuch, but broader at the base, moderately depressed about the foot-stalk, very hollow at the top, where the leaves of the calyx remain long and rolled back. Flesh, pale yellow, soft and excellent to eat ripe from the tree; roasts and bakes well till Christmas.

Minier's Dumpling. Size, from three to three inches and a half in breadth, but not so long. Colour, deep green, and very dark red next to the sun; which, together with its spherical shape, more contracted at the top, and swelled into a few imperfect angles, give it some appearance of the Norfolk Storer, but there are darker green lines on the north side, which distinguish it from all the Apples I know. It is depressed about the stalk, which is long, and stout enough for so large an Apple. The calyx is nearly obliterated by the time the fruit is ripe, which is not till Christmas, or after. It is most valuable for boiling or baking till April, and even to eat at the end of the season. Its flesh firm, high flavoured, and juicy.

XII. *On the Cultivation of the common Flax* (Linum Usitatissimum *of Linnæus*), *as an ornamental Plant in the Flower-Garden.* *By Mr.* JOHN DUNBAR, *Gardener to* THOMAS FAIRFAX, *Esq.*

Read March 3, 1808.

THE Horticultural Society will perhaps honour with their attention a short paper, the object of which is to bring into cultivation the common *Flax*, as an ornament of the Flower-garden, not merely as such, but with a view to the profit it will afford, at least to the servant, if not to the master; and the interest of the former can seldom be promoted in an honest way, without some benefit accruing to the latter. This plant when so cultivated, like wax and honey, forms part of the natural riches of a country, and if it could supplant the cumbersome yellow Lupine in our Flower borders, the annual revenue arising from it would amount to several thousand pounds.

If gardening were in its infant state among us, a complete treatise on the culture of this plant might be necessary: but as this is not the case, only what is essentially material will be noticed, with some directions how to prepare the plant after it is gathered. They are the result of several years experience, and by which a family consisting of five persons has been supplied with all the linen they required.

LINUM USITATISSIMUM.

Common Annual Flax.

L. calycibus capsulisque mucronatis, petalis crenatis, foliis lanceolatis alternis, caule subsolitario. *Hall. Helv. n.* 836. *Linn. Mat. Med.* 90. *Gmel. Sib.* 4. *p.* 115. *Mill. Dict. n.* 1. *Scop. Carn.* 2. *n.* 381. *Kniph. Cent.* 9. *n.* 57. *Knorr. del.* 2. *t. L.* 9. *Ludw. ect. t.* 144. *Hoff. Germ. III. Roth. Germ. I.* 139. *II.* 370.

L. ramis foliisque alternis lineari-lanceolatis, radice annua. *Hort. Cliff.* 113. *Roy. Lugdb.* 433. *Phil. Bot.* 261*.

L. foliis alternis lanceolatis integerrimis, calycibus acuminatis, capsulis mucronatis angulatis. *Hort. Ups.* 71.

L. sylvestre. *Matth.* 406. sativum plane referens. *Bauh. Hist.* 3. p. 492.

L. arvense. *Bauh. Pin.* 214. *Ray. Hist.* 1073. *Neck. Gallob.* 159.

β. Linum sativum. *Bauh. Pin.* 213. *Blackw. t.* 160.

γ. Linum sativum humilius, flore majore. *Boerh. Lugb.* 1. *p.* 284.

L. (*humile*) calycibus capsulisque mucronatis, petalis emarginatis, foliis lanceolatis alternis, caule ramoso. *Mill. Dict. n.* 2. R.

δ. Linum sativum latifolium africanum, fructu majore. *Tournef. Inst.* 339.

Habitat hodie inter segetes Europæ *australis.*

The soil of every Flower-garden is always rich enough to produce good Flax; but if it is loamy rather than sandy, the quantity will be nearly double: even in the fields, which can

never be cultivated with the nicety of a gentleman's garden, I have observed the greatest crops in a loamy soil, and that they yielded an article superior in quality as well as quantity: for as the durability of the fibre depends in some measure upon its size, there can be no doubt that tall and vigorous plants are preferable to small ones.

There are various ways of disposing this plant so as to be exceedingly ornamental, but none more so than scattering it in random parcels, or little clumps of from 10 to 20 plants, towards the back of the flower-borders, and in the front of the shrubbery: for, without the summer proves uncommonly dry, it will attain to the height of three and four feet. If a temporary edging, or summer screen, is wanting for any particular bed, it may be also employed for this purpose.

The seeds of good Flax are short, plump, thick, very oily, and of a bright brown colour. The best season for sowing them, in most gardens, is February, or the beginning of March, when the general crop of hardy annuals is put in; but if the ground be sandy, and naturally dry, they should be sown in October or November. No more attention than what is necessary for the other flowers in the garden, which is keeping down all weeds, while in the seed leaf, with a hoe, will be requisite for this. As soon as the seed begins to ripen, and the plants turn yellow, pull the whole up by the roots, and lay them in bundles exposed to the full sun, if the weather is fine, to dry completely. Then pull the heads off, and shake out the seeds. Immediately after, they must be laid to macerate in a ditch, or pond of water, and kept under by a long piece of timber floating upon them. From five to ten days is the time necessary for their immersion, and after the fifth,

they must be examined daily, taking especial care that they do not lie too long. As soon as the fibres are sufficiently macerated to separate from one another freely, spread the plants out to dry upon a new mown meadow. When dry, they must be again collected into bundles, and either sent to the Flax-dresser, or prepared for spinning at home. In many districts, this operation is well understood, and if carefully performed, homespun linen from such Flax will last twice the time of most of the Irish linen which is now to be purchased in the shops.

I believe it is a great error to pull the Flax so green as is commonly practised, and a still greater to soak it in water, before it is previously dried: for the fibres in that case require twice the time to macerate sufficiently for separation in the dressing; and consequently are considerably weakened.

XIII. *An Account of the Method of cultivating the American Cranberry* (Vaccinium Macrocarpum), *at Spring Grove. By the Right Hon. Sir* Joseph Banks, *Bart. K. B. P. R. S. &c.*

Read March 1, 1808.

The American Cranberry, the *Vaccinium Macrocarpum*, has for some years been cultivated with success at Spring Grove, and as the Fruit of it is now become an object of some importance in the economy of the family, a short account of the management of this unimproved Plant will, it is to be hoped, prove acceptable to the Members of this useful Society, and not uninteresting to the Public at large.

For the better understanding the intended communication it is necessary to premise, that a spring rises in a small grove within the precincts of Spring Grove, which is no doubt the origin of the name; this spring is carried in leaden pipes into the house, to which it affords an ample supply; the waste water is suffered to run through a small basin and a pond in the pleasure ground, before it escapes to Smallbury Green; to this constant supply of fresh water, though it is very small, the great luxuriancy with which water plants of all kinds suitable to this climate, succeed in the pond, is no doubt in some degree to be attributed.

In the middle of the basin, a small Island has been formed, by supporting a box of oak upon posts driven into the bottom; in the centre of this pond, the waste water which used

before to issue through a fountain, is suffered to flow in the form of a spring, which rising into a large shell of the *Chama Gigas*, perforated for the purpose, imitates very well a natural spring, and gives in hot weather an appearance of freshness and coolness, very pleasant to those who walk in the garden.

The oak box, which constitutes this artificial island, is circular, twenty two feet in diameter, and thirteen inches deep; the bottom is five inches under the surface of the water, and bored through with many holes; on this a layer of stones and rubbish was first placed, and upon that a covering of bog earth, brought from Hounslow Heath, which together are five inches below and seven inches above the surface of the water of the basin; in this bed of black mould, a variety of curious bog plants were placed about seven years ago, which flourished in an unusual degree, among these was the *Vaccinium*, which flowered and ripened its fruit the first year.

In the autumn of the second year it again produced a plentiful crop, and soon after began to send out runners somewhat resembling those of a Strawberry, but longer and rather less inclined to take root while young; they did however take root in the winter, and early in the spring threw out upright branches ten inches and a foot long, on which the flowers and fruits were chiefly placed; the produce was this year gathered, and found to be high flavoured berries, very superior to those imported, which have in general been gathered unripe, and have become vapid, and almost tasteless by long soaking in the water in which they are packed for carriage.

It was now determined to consider the American Cranberry as an article of kitchen garden culture, and to give up the

whole of the island to it, which in a few years it entirely covered by its own runners, without any fresh plants being put in, and this bed, with the addition of some hanging boxes receding from the centre to the sides, produced in the year 1806, twenty-three bottles of very fine Cranberries.

In the year 1805, a bed was made on the side of the pond twenty feet long and five feet and a half broad, by a few stakes driven into the bottom parallel to the side, and lined with old boards; the bottom of this was filled up with stones and rubbish, and on these a bed of black mould, three inches above and seven inches below the usual surface of the water, was laid: this was planted with Cranberry plants, many of them having been rooted in a hot bed, in which they throve most vigorously. In this autumn, 1807, the bed produced a crop which, added to that of the island, afforded a supply for the family, of five dozen bottles of Cranberries, besides a small basket reserved for present use. The total contents of the two Cranberry beds, is three hundred and twenty six square feet; the quantity of land employed for raising Strawberries at Spring Grove, is, after the divisions between the beds have been deducted, five thousand, six hundred and forty five square feet; the beds necessary to give a sufficient supply of Cranberries for the family, did not therefore occupy quite one-eighth of the space allotted to Strawberries.

The Society will, I hope, forgive this detail of the origin and progress of this kind of cultivation: successful as it has been, it must still be considered in its infancy, and not sufficiently established to afford general rules for the regulation of a gardener's proceedings; it originated entirely in a fortunate accident, the history of which, will, it is hoped, give an

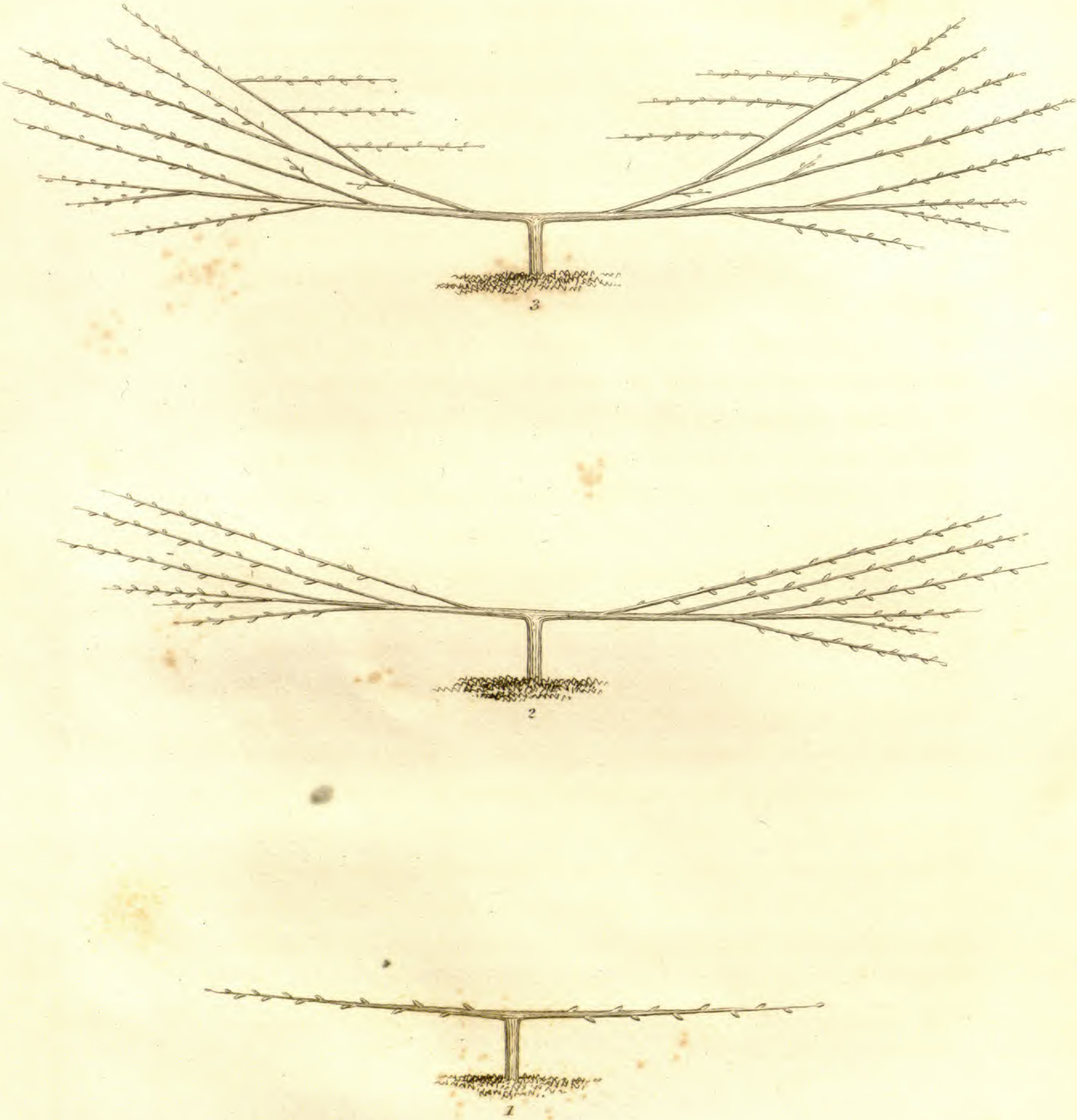
adequate idea of the method now practised, and at the same time bear testimony in favour of the opinion, that more benefit has been derived in the advancement of Horticultural knowledge, by pursuing the hints which nature continually gives, than from the effects of abstract reasoning and original invention.

It is remarkable that, during the seven years these Cranberries have been cultivated at Spring Grove, no circumstance has arisen, from the variety of seasons, from blight, or any other circumstance, that has diminished the quantity of a full crop; the flowers have issued out their buds, in abundance, in their due season, and fewer of them have been abortive, than in general is the case in other plants. The fruit has gradually swelled and duly ripened, without being subject to the attack of any vermin, or to injuries of any kind from the excesses of heat or cold, or from those of wetness or of drought.

Note added by the Author to the Second Edition.

The crop of 1813 produced three Winchester bushels and a half, which, at five to the gallon, gives one hundred and forty bottles; each bottle, being on an average the produce of two feet and a half square, is sufficient for one pye.

Mr. Knight's method of Training Trees.



XIV. *On a new Method of* training Fruit Trees. *By* Thomas Andrew Knight. *Esq. F. R. S. &c.*

Read April 5, 1808.

From the result of experiments I have made to ascertain the influence of gravitation on the descending sap of trees, and the cause of the descent of the radicle, and ascent of the expanding plumule of germinating seeds,* I have been induced to believe that none of the forms, in which Fruit Trees are generally *trained*, are those best calculated to promote an equal distribution of the circulating fluids; by which alone permanent health and vigour, and power to afford a succession of abundant crops, can be given. I have therefore been led to try a method of training which is, I believe, different from any that has been practised; and as the success of this method has fully answered every expectation I had formed, I have thought a concise account of it might not be unacceptable to the Horticultural Society. I confine my account to the Peach Tree; though, with a little variation, the method of training and pruning, which I recommend, is applicable, even with superior advantages, to Cherry, Plum, and Pear Trees; and I must observe, that when trees are by any means deprived of the motion, which their branches naturally receive from winds, the forms in which they are trained, operate more powerfully on their permanent health and vigour, than is generally imagined.

* See Philosophical Transactions for 1806 and 1807.

luxuriant shoots of the Peach Tree, the origin and office of which, as well as the right mode of pruning them, are not at all understood, either by the writers on Gardening of this country, or the Continent.

I have shown in the *Philosophical Transactions* of 1805, that the alburnum, or sap wood of Oak trees loses a considerable part of its weight during the period in which its leaves are formed in the spring: and that any portion of the alburnum affords less extractive matter after the leaves have been formed than previously. I have also shown that the aqueous fluid which ascends in the spring in the Birch and Sycamore, becomes specifically heavier as it ascends towards the buds; which I think, affords sufficient evidence that the alburnum of trees becomes, during winter, a reservoir of the sap or blood of the tree, as the bulb of the Hyacinth, Tulip, and the tuber of the Potatoe, certainly do of the sap or blood of those plants. Now a wall-tree from the advantageous position of its leaves relative to the light, probably generates much more sap, comparatively with the number of its buds, than a standard tree of the same size; and when it attempts to employ its reserved sap in the spring, the gardener is compelled to destroy (and frequently does so too soon and too abruptly) a very large portion of the small succulent shoots emitted, and the Aphis too often prevents the growth of those which remain. The sap in consequence stagnates, and appears often to choke the passages through the small branches; which in consequence become incurably unhealthy, and stunted in their growth: and nature then finds means of employing the accumulated sap, (which if retained would generate the morbid exudation, gum,) in the production of

luxuriant shoots. These shoots all gardeners, from Langley down to Forsyth, have directed to be shortened in summer, or cut out in the succeeding spring: but I have found great advantages in leaving them wholly unshortened; when they have uniformly produced the finest possible bearing wood for the succeeding year; and so far is this practice from having a tendency to render naked the lower, or internal parts of the tree, whence those branches spring, that the strongest shoots they afford invariably issue from the buds near their bases. I have also found that the laterals that spring from these luxuriant shoots, if stopped at the first leaf, often afford very strong blossoms and fine fruit in the succeeding season. Whenever therefore space can be found to train in a luxuriant shoot, I think it should be rarely or never be either cut out, or shortened: it should, however, never be trained perpendicularly, where that can be avoided.

XV. *Observations on the different Species of* Dahlia, *and the best Method of cultivating them in* Great Britain. *By* Richard Anthony Salisbury, *Esq. F. R. S. &c.*

Read April 5, 1808.

No flowers which have been lately introduced into the gardens of this island are more showy than the *Dahlias*; and they possess the additional merit of being produced at a season, when most others are decaying; nevertheless, it will appear in the subsequent pages, that by a little management these plants may be made to blossom at a much earlier period; and that in vallies, or low situations, where our autumnal frosts frequently cut them off early in October, it is the only method of obtaining their flowers at all. I am more emboldened to offer these results of my own experience to the Horticultural Society, as they have turned out very different to what was expected, from the hints thrown out upon this very subject, by one of the first Gardeners in the world.

The earliest account I am able to trace of these plants, which are all natives of Mexico, is in Hernandez' History of that country, published in 1651, where two species are figured. The first, he says, grows in the mountains of Quauhnahuac, and is called *Acocotli* by the inhabitants; that it has leaves composed of five leaflets, some of which are sinuated, and slender peduncles, with pale red stellated flowers; that the roots are tuberous, strong and bitter in taste, and

according to the fashionable jargon of his time, hot and dry in the third degree; that an ounce in weight, taken internally, is a powerful medicine, alleviating pains in the bowels, expelling flatulence, increasing the urinary discharge, promoting sweat, strengthening cold languid stomachs, excellent against the cholic, resolving obstructions and dissipating tumours if externally applied: this is clearly the pale red variety of Dahlia Sambucifolia; the second he calls *Acocotli Ligustici facie*, but gives no description of it: the figure, however, though destitute of flowers, leaves no doubt that it is the species called Dahlia Bidentifolia in *Paradisus Londinensis*, and from the size of its foliage, most probably the orange-coloured variety.

M. Thiery Menonville, in the interesting detail of his journey to Guaxaca, published in 1787, is the next author, who to the best of my knowledge, has noticed any species of Dahlia. It is well known, that this Botanist was employed by the French Minister, to steal the Cochineal Insect from the Spaniards. In this dangerous mission, he tells us, that having entered one of the gardens in the suburbs of that city, adjoining to a plantation of *Nopals*, upon which the Insect feeds, he was struck with the beauty "d'une Astere violette et double, aussi grande que celles de France, mais produite par un arbuste très semblable pour les feuilles pinnées à notre sureau." From the violet colour of the flower, I am inclined to think that this is the species which I have called Dahlia Sphondylifolia.

The third author, who has written upon these Plants, is the late Abbé Cavanilles: from a semidouble variety of Dahlia Sambucifolia, which flowered at Madrid in October 1790, he, in the first Volume of his *Icones*, published in the following January, first defined the characters of the genus

scientifically, naming it in honour of ANDREW DAHL, a Swedish Botanist, with the specific title of Pinnata. Afterwards, in the third volume of the same work, he makes us acquainted with two more species; his Rosea, which from this ambiguous title has been confounded both here and at Paris, with his first; and his Coccinea, no less absurdly so denominated, its ligulated florets varying from yellow to orange, but never assuming a scarlet tint. My reasons for adopting his generic, but none of his specific names, will be given hereafter, and are conformable to the usage of LINNÆUS in those classical works, *Flora Lapponica* and *Hortus Cliffortianus.*

These three Dahlias having been sent to *Paris* from *Madrid* by CAVANILLES in 1802, a very ample memoir with coloured figures was published two years afterwards by Monsieur THOUIN, in that celebrated national work the *Annales du Museum d'Histoire Naturelle*, and he makes the fourth writer upon them. We there learn that they are perennials, losing their stems at the approach of winter, which do not push forth again till late in spring; that their roots consist of fleshy tubers disposed like those of the Asphodel, though less numerous; that on their arrival they were planted in large pots of strong earth, and protected from frost under a frame; that the stems grew little till the great heats of summer commenced, when they lengthened rapidly, and flowered in the end of autumn. Monsieur THOUIN then describes the first, his *Dahlia Rose*, as attaining seven feet in height; leaves opposite, composed of from 5 to 9 leaflets: flowers about the size of a China Aster; ligulated florets commonly 8 in number, pale red inclining to flesh colour; of which all the earlier flowers ripened seeds. The second, his *Dahlia Ponceau*, was only four feet high; stem slender,

covered with a fine meal; leaves doubly pinnated, and pale green; flowers smaller than in the two other species; ligulated florets from 8 to 9, red orange colour; this flowered later, and did not ripen seeds. The third, *Dahlia Pourpre*, he erroneously supposes to be CAVANILLES' Dahlia Pinnata, and thinks it greatly superior in beauty to both the others; the roots of this, he observes are covered with a violet coloured cuticle; stems about five feet high; leaves often produced in threes; flowers semidouble: ligulated florets of a rich violet purple, approaching that of the Viola tricolor, or still more like the skin of the Prune de Monsieur Plum, which on their inner surface reflect the light variously *(chatoyante)* like a shot silk; it flowered the latest, and ripened very few seeds. After paying some handsome compliments to CAVANILLES for sending, and to Dr. THIBAUD for bringing, the roots from Madrid, this candid and judicious gardener proceeds to state what, he conceives, will be the properest mode of treating these plants. He remarks that being newly arrived, with all the original habits contracted in their native climate, it will only be after a lapse of years, that their culture can be thoroughly understood: and that if he anticipates any directions on this head, it is rather to excite the attention of others to the subject, than to lay down fixed and positive rules for their conduct. From the magnitude of the roots, the abundant foliage, and rapid expenditure of sap in these plants, he concludes that a strong but very rich soil, nearly such as Orange trees delight in, will be most suitable for them, with plenty of water in dry weather. Being ignorant of their particular locality in Mexico, he doubts whether they will live through the winter at Paris in the open ground, giving his opinion in the negative, for the

following reasons; 1st, herbaceous plants so tall and tender are seldom met with in high mountains, the dominions of winds, snows, and storms; 2*dly*, these plants, when exposed to a temperature of 7 or 8 degrees below zero, turn yellow and sick; 3*dly*, they are late in beginning to vegetate, and require a long protracted autumn to expand their flowers: 4*thly*, their roots had been already killed at Paris, by a frost of five degrees in one night. Notwithstanding this unfavourable statement, Monsieur THOUIN does not despair of being able in time to change their habits, and acclimate them in France: to this end, he proposes forwarding them in spring with a little artificial heat, and wisely remarks that our days in summer being longer than in Mexico, a sufficient maximum of heat to bring their flowers and seeds to perfection may thus be obtained; that thus Barley, which in the north of France, requires six months to ripen in, is often perfectly matured in Russia, in forty days. He then brings instances of two plants from the same country, the Marvel of Peru, and Long-flowered Marvel of Peru, which, though very tender when first introduced, are now become more hardy, the former, especially, often springing up in their parterres, from self-sown seeds. Lastly he informs us, that all the Dahlias may be increased by seeds, dividing their roots, or even by cuttings of their stems, though that part is annual; but seedling plants, he remarks, do not flower the first year, and the memoir concludes with some general remarks on the beauty, and ornament, which they will add to our borders or conservatories, in autumn.

The fifth author upon this genus is Professor WILLDENOW, who in his *Species Plantarum* most unwarrantably changes

its name, under the pretext that another Dahlia was already established in the class *Dioecia*. This is so far from being true, that the description of the Cape Plant he alludes to, by Professor THUNBERG, in the *Skrivter af Naturhistorie Selfskabet*, 2 *bind*, did not come out till 1792; nor was the manuscript even read before that society, till April, 1791, three months after CAVANILLES' Dahlia had been published. I am aware that there is no general rule without an exception, and that in some cases the right of priority must be given up, but in this, not a shadow of reason for the innovation can be offered, and as these plants are universally known, both in our Island, and upon the Continent by the name of Dahlia, much inconvenience will ensue for a time, if the other be adopted: moreover, it would be unjust to CAVANILLES, who is now dead.

I must now venture to give some account of the introduction of the Dahlias into our own Island; by which it will appear how rapidly we have improved upon the French method of treating them; and as they have already not only produced a number of varieties with us, but each species requires a somewhat different management, I shall first describe the genus, species, and varieties botanically, and then offer such observations, as I hope will not be found quite useless respecting them, after the manner of our own Prince of Gardeners, PHILIP MILLER, whose Dictionary, LINNÆUS, has justly called "Lexicon non solum hortulanorum sed botanicorum."

DAHLIA.

Ordo Naturalis.

Corymbiferæ. Juss. Gen. p. 177.

Sect. II. Receptaculum foliolis calycinis, persistentibus

paleaceum. Pericarpium apice plus minus 2-dentatum Flosculi exteriores sæpius ligulati.

Bracteæ 5-9 basi planâ calycis imbricatæ, reflexæ, spatulatæ, subæquales. Calyx polyphyllus : foliolis 7-9 exterioribus in-ferne in cylindrum simplici serie positis, interioribus sensim angustioribus. Flosculi ligulati tot quot foliola exteriora calycis, grandes, ovales, feminei, haud raro steriles ; infun-dibuliformes hermaphroditi, fertiles. Pericarpium compres-sum latere interiore prominentiore, obsolete 2-dentatum. *Plantæ altæ rudesque, radice tuberosâ fasciculatâ. Caulis teres, basibus petiolorum annulatus. Folia opposita, plus minus decomposita, in aliis 2-pinnata, aspera. Flores autumnales, speciosi, pedunculis longis terminales, ramulis foliisque supe-rioribus sensim minoribus quasi paniculati, ante florescentiam cernui, flosculis ligulatis nocte conniventibus. Genus* Coreopsidi *et forsan* Uvedaliæ *proximum, quod in memoriam* Andreæ Dahl *Botanici Sueci, dicavit* Cavanilles.

1, D. *(Sambucifolia)* foliis primariis impari-pinnatis ; foliolis 2-3-jugis : flosculis ligulatis $1\frac{1}{2}$-2 pollices longis, incurvo-horizontalibus, supra lævibus.

Variat α. Flosculi ligulati carnei fundo fuligineo.

Acocotli. *Hern. Hist. Mex. lib. 2. p. 3. cum. Ic.*

β. Flosculi ligulati rosei fundo vix fuligineo.

D. Rosea. *Buonaiuti in Macd. Gard. Dict. v. 2. p. penult.*

D. Sambucifolia. β. *Par. Lond. n.* 16. *cum. Ic.*

D. Rose. *Thouin in Ann. du Mus. v.* 3. *p.* 421.

γ. Flosculi ligulati pallide lilacini.

D. Rose. *Thouin in Ann. du Mus. v.* 3. *t.* 3. *f.* 3. ad amussim nostro exemplari concolori.

δ. Flosculi ligulati lilacini.

ε. Flosculi ligulati purpurei.

D. purpurea. *Buonaiuti in Macd. Gard. Dict. v. 2. p. ult. t.* 19.

ζ. Flosculi ligulati saturate purpurei.

Georgina purpurea. *Willd. Sp. Pl. v.* 3. *p.* 2124.

D. pinnata. *Haworth in Bot. Rep. n.* 408. *cum Ic.* D. Pinnata. *Cav. Ic. v.* 1. *p.* 57. *t.* 80. ad specimen flosculis ligulatis multiplicatis.

Sponte nascentem in Mexico montibus, legit L. Nee.

Floret apud nos, a *Septembri* in *Novembrem.*

Præter supra memoratas, aliæ intercedunt varietates, coloribus nonnihil abludentes : herbam insuper, uti flosculi ligulati purpurâ saturatius tingebantur, constanter robustiorem vidi, foliis magis ad sequentem speciem accedentibus, ut e mixturâ ejus pollinis hasce ortas esse, nullus dubitem. Omnes ludunt flosculis ligulatis plus minus multiplicatis.

2. D. (*Sphondyliifolia*) foliis primariis impari-2-pinnatis ; foliolis 2-3-jugis : flosculis ligulatis $1\frac{1}{2}$ pollicem longis, incurvo-horizontalibus, supra velutinis.

Variat α. Flosculi ligulati saturate purpurei.

Georgina rosea. *Willd. Sp. Pl. v.* 3. *p.* 2124. D. rosea. *Cav. Ic. v.* 3. *p.* 33. *t.* 265.

β. Flosculi ligulati saturate violaceo-purpurei.

D. Rosea. *Buonaiuti in Macd. Gard. Dict. v.* 2. *p. ult.*

D. Pourpre. *Thouin in Ann. du Mus. v.* 3. *p.* 423.

t. 3. f. 3. ubi cum titulo *Pinnata*. Astere violette et double. *Thiery de Menonv. Voy. tom.* 1. *p.* 131.

Sponte nascentem in *Mexico*. legit L. Nee.

Floret apud nos reliquis serius, ad finem *Septembris, Octobris.*

3. D. (*Bidentifolia*) foliis plerisque impari-2-pinnatis ; foliolis 2-5 jugis : flosculis ligulatis 10-12 lineas longis, parum reflexis, supra glabris.

Variat α. Flosculi ligulati lutei.
D. Crocata. *Buonaiuti in Macd. Gard. Dict. v. 2. p. penult.*
D. Bidentifolia. *Par. Lond. n.* 19. *cum Ic.*
β. Flosculi ligulati saturate miniati.
D. Coccinea. *Sims in Bot. Mag. n.* 762. *cum. Ic. bonâ.*
Georgina Coccinea, *Willd. Sp. Pl. v.* 3. *p.* 2124.
D. Ponceau. *Thouin in Ann. du Mus. v.* 3. *p.* 422. *t.* 3. *f.* 2. ubi cum titulo *Coccinea.* Acocotli Ligustici facie. *Hern. Hist. Mex. lib.* 2. *p.* 32. *cum Ic.* absque textu.

Sponte nascentem in *Mexico*, legit L. Nee.

Floret apud nos *Septembri, Octobri.*

The first species, *Dahlia Sambucifolia*, was introduced into this country by the Right Honourable Lady Holland, who sent the seeds from Madrid in May, 1804, which have produced all the abovementioned varieties, besides others

with intermediate tints : for this reason I have rejected both the specific names Rosea, and Purpurea, for one that is applicable to all of them. Pinnata, as Monsieur THOUIN observes, is equally inadmissible, because many of its leaves only consist of three leaflets, and a greater number of the leaves of the second species being also pinnated, it has already occasioned much confusion. Though the seeds arrived so late in this country, several of them flowered the succeeding autumn at Holland House, and the variety ζ with deep purple flowers, was immediately pretty well figured in the *Botanist's Repository*. By the constant attention of Mr. BUONAIUTI, in pressing out the moisture, which is collected among the florets after the calyx closes, a number of seeds were ripened in 1805, and some of these were liberally communicated to me late in the month of April, 1806. I had no opportunity of sowing them till the 5th of May, when they were put in two pots of light rich earth, plunged to their rims in a bed of dung, which had nearly lost its heat, having been made two months. A dozen plants soon came up, and on the first of June, being about five inches high, as well as very stiff, from the lights having been taken off in the day time, were transplanted separately into pots of two inches and a half in diameter. In these they continued three weeks, when two of the strongest were removed without breaking any of their fibres into large pots of very rich mould, with the intention of following Monsieur THOUIN's directions minutely, five of them into pots one size larger, of very rich mould, and five of them into pots one size larger, of poor sandy mould: all these plants were twice more transplanted into somewhat larger pots before the 10th of August, by which time the two largest were four feet high, and the others not much shorter, though less branched.

They were now all removed from the hot-bed frame, having been exposed to the open air both night and day during the last month; the two largest into a border of rich earth, and the rest plunged as they stood in the pots, in various parts of the garden, near the walls, but only in west and east aspects, that to the south being entirely filled with other plants. Their stems and branches, as they advanced, were carefully secured from being broken by the winds, and they were supplied with water, whenever their leaves flagged. They all grew rapidly in August and September, but I despaired of seeing any flowers, till the middle of the latter month, when almost every branch terminated in a flower, the first of which opened the 7th of October. Soon after others came out; but what is well worthy of attention, the two largest plants which had been nourished the most luxuriously, though placed in the warmest corner, were the latest in showing flowers. One of these, which had attained to twelve feet in height, did not expand its first flower till the 29th of October, producing however, a plentiful succession till the beginning of December; in the first week of which a violent storm of wind and rain, nearly put a stop to its vegetation. All the plants ripened seeds more or less, and were suffered to remain in the ground with their decaying stems uncut, till a frost came, which was severe enough to freeze the borders, an inch deep: the morning after, those which had been plunged in their pots, were taken up and removed into the greenhouse, behind other plants: the two in the ground, after cutting down their stems to about a foot and a half in length, and removing the frozen crust of earth, were protected with a covering of moss and fern about six inches thick. In 1807, the greenhouse plants were removed into

the open air so early as the 27th of April, and the Dahlias at the same time just beginning to push, were turned out of the pots, and planted in very different parts of the garden, as well as in very different soils. Having observed in the preceding year, that those which had been confined in the smallest pots and poorest earth, not only flowered the earliest, but made, to a gardener's eye, the handsomest plants, being only from five to six feet high, with scarcely any branches, and panicles of from seven to thirteen flowers, I ordered some of them to be placed in pure gravel, from which all the larger stones had been screened, others in a dry seam of sand which crossed the garden, and others again in rich earth: they were all supplied with water however during the dry part of summer. Besides these, a number of seedling plants were distributed at random in different gardens, and what gave me no little satisfaction, I observed in June, near the largest plant, a cluster of young seedlings coming up from a head which had been supposed rotten, and dug into the border at its winter cleaning. The result in autumn was very similar to that of the former year, but with a still more decided advantage to the plant in screened gravel. One of these expanded its first flower the 19th of August, and its last the 27th of September, all the seeds ripening perfectly: being the dark purple variety ζ, and planted singly in the middle of an open grass plat, it attracted far more attention than the venerable Chestnuts, Magnolias, Cembra Pines, Cedars, and Cypresses, relicts of PETER COLLINSON's labour, which surrounded it. The largest plant against the south-east side of the house, in rich earth, had not opened a single flower on the 14th of October, when I left the place; but though plants at Holland

House as well as in Messrs. LEE and KENNEDY's garden at Hammersmith, had then been already blasted by the frosty nights, I understand, it remained uninjured, and continued blowing till the middle of November, in great beauty.

It is necessary to observe that the village of Mill Hill, where I lately resided, is situated upon a high ridge, at the head of two vallies, in which some of the sources of the little brook, called the Brent, arise; and the garden, in which these Dahlias were cultivated, is well screened from the weather by high trees; being rather above the level at which the exhalations of the adjacent country pass off, the early autumnal and late spring frosts never reach it; at least they have been so mild during the six years I lived there, as never to have cut off Cucumber Plants, Potatoes, French Beans, and Nasturtiums, till long after others of the same species had been killed in the vallies. In hoar frosts, the top of Harrow Hill, Bushy Heath, Elstree, and Totteridge, are commonly seen green, or illuminated by the sun, when the rest of the neighbourhood is white as snow, or obscured in a thick fog. The medium temperature of this delightful spot, and I believe of most other grounds equally elevated, during the months of December, January, and February, is considerably milder than in any valley, perhaps never less than from 1 to 5 degrees: in extremely severe frosts, the difference is still more apparent, so that when the cold has been down to 12 and 9 degrees of Fahrenheit's thermometer in London, it has only been 20 and 16 there; and this is likewise proved by the more tender exotic plants still remaining in the garden, some of them 60 and 70 years old. The common broad leaved Myrtle against a wall there, quickly grew to 6 feet in height without any

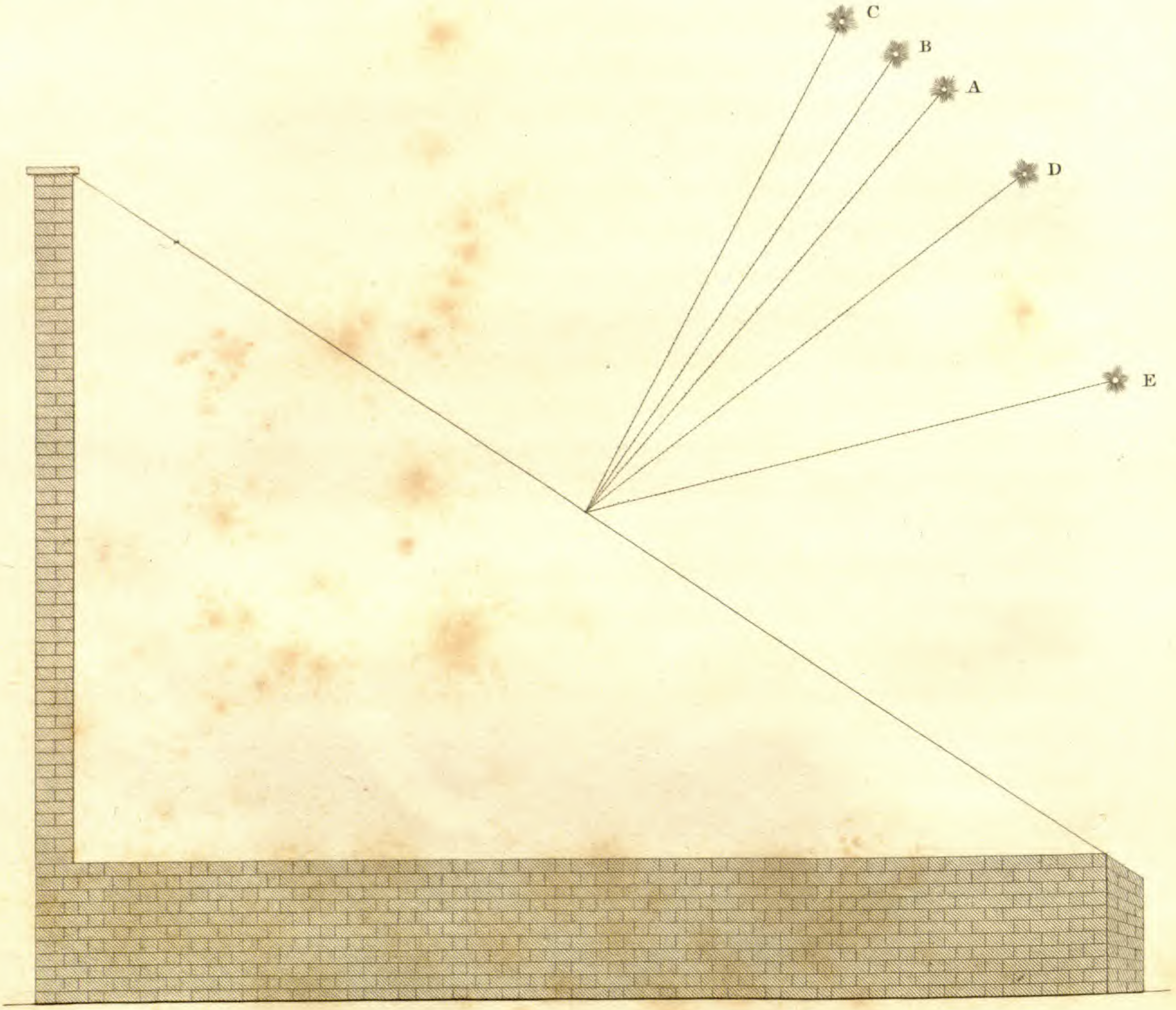
covering, and the Cupressus Sempervirens, as well as Arbutus Unedo, are rarely scorched, and never killed. The summer temperature of Mill Hill, on the contrary, is as much cooler than that of the vallies, as its winter temperature is milder; and it suffers greatly in dry seasons from the want of those dews, which refresh the latter; both circumstances unfavourable to the success of such perennial plants as the Dahlias: nevertheless they have apparently succeeded better here than in any other place.

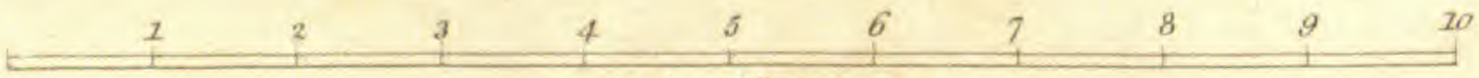
No intelligent gardener, after reading the foregoing detail, can be at a loss how to treat these plants, nor is there the smallest doubt, that by checking the luxuriance of the herbage, their flowers may be brought to perfection, even in situations the most exposed to autumnal frosts. I have only one caution to give, which is, that in whatever soil they are planted, but especially if it is poor and gravelly, they must be duly watered in dry weather, till the flower-bud can just be discovered in the heart of the leaves; after which they will require none whatever. Insects do not appear to attack them much, except Earwigs, and for these I know no remedy but personal labour in catching and destroying them: that their numbers and consequent havoc, however, may be wonderfully diminished in the course of a few years, by moderate exertions, I have twice experienced.

The seeds of the second and third species, *Dahlia Sphondyliifolia*, and *Bidentifolia*, were also sent along with those of the first, from Madrid, in May, 1804, by the Right Hon. Lady HOLLAND; but one plant of the former had been previously introduced from Paris, by E. J. A. WOODFORD, Esq. and had flowered in his garden at Vauxhall in the au-

tumn of 1803. The same reasons for which I have changed the specific name of the first species, oblige me to offer new ones for these two. CAVANILLES' names are actually false: for, no variety of the second has yet been seen with rose coloured florets: nor of the third with scarlet: so that on this account Dr. SIMS has very justly hesitated to quote him in the *Botanical Magazine;* and a yellow variety having since been introduced, it is become doubly objectionable. Both these species are more tender and flower later than the first, so that they require with us every help which art can give to forward them in spring. The best method I can suggest, and which succeeded at Mill Hill, is to keep them always in pots, except a plant is wanted to be much branched for making cuttings. After the first day of April, accelerate their growth in a very airy frame, exposed as much as possible to the light, but with very little or no bottom heat from dung, and about the middle of June, plunge the pots close to a south east, or south wall, nailing up the branches as they shoot. All the secondary branches should be pinched off while tender, with the finger and thumb, and even their principal leaves partly cut off, if the plants are disposed to be very luxuriant; just water enough to keep them growing must be given daily, but no more. I need not add, that in such heavy rains as sometimes fall here after the summer solstice, they must have no water at all; but rather, if possible, be protected from their violence by a glass light.

Inclination of Mr. Knight's forcing-house.





Scale of Feet.

XVI. *A Description of a* Forcing House *for Grapes; with Observations on the best Method of constructing Houses for other Fruits.* *By* Thomas Andrew Knight, *Esq. F. R. S. &c.*

Read May 3, 1808.

So much difference of opinion prevails amongst gardeners respecting the proper forms of *Forcing Houses*, that two are rarely constructed quite alike, though intended for the same purposes; and every gardener is prepared to contend that the form he prefers is the best, and to appeal to the test of successful experiment, in support of his opinion. And this he is generally enabled in some degree to do, because plants, when properly supplied with food and water and heat, will succeed in houses, the forms of which are very defective; and proper attention is not often paid by the gardener, when his prejudices satisfy him that his labours can not be successful. It is, however, sufficiently evident, that, when the same Fruit is to be ripened in the same climate and season of the year, one peculiar form must be superior to every other, and that in our climate, where sunshine and natural heat do not abound, that form, which admits the greatest quantity of light through the least breadth of glass, and which affords the greatest regular heat with the least expenditure of fuel, must generally be the best: and if the truth of this position be admitted, it will be very easy to prove that few of our Forcing Houses are at present even moderately well constructed. I therefore think that if plans

and descriptions of such Forcing Houses, as theory and practice prove to have been properly constructed for the culture of every different species of fruit, were published by the Horticultural Society, much useful information might be conveyed to the practical gardener. Under these impressions I send the following description of a Vinery, in which the most abundant crops of Grapes have been perfectly ripened within less time, and with less expenditure of fuel, than I have witnessed in any other instance.

It is well known that the sun operates most powerfully in the Forcing House, when its rays fall most perpendicularly on the roof; because the quantity of light, that glances off without entering the house, is proportionate to the degree of obliquity with which it strikes upon the surface of the glass; and it is, therefore, important to every builder of a Forcing House to know by what elevation of the roof, the greatest quantity of light can be made to pass through it To ascertain this point, I have made many experiments, and the result of them has satisfied me that, in latitude 52°, the best elevation is about that of 34 degrees; and relative to that elevation the position of the sun, in different parts of the year, will be nearly as represented in the annexed sketch, which is taken from the Vinery I have mentioned. About the middle of May, the elevation of the sun will nearly correspond with that of the asterisk A, and in the beginning of June, and again early in July, it will be vertical at B, and at Midsummer it will, at C, be only six degrees from being vertical. The asterisk D points out its position at the equinoxes, and E its position in midwinter.

In this building, which is forty feet long, and is heated

by a single fire place, the flue goes entirely round without touching the walls; and in the front a space of two feet is left between the flue and the wall, in the middle of which space the Vines, which are trained to the roofs, about eleven inches from the glass, are planted; and as both the wall and flue are placed on arches, the Vines are enabled to extend their roots in every direction, whilst, in the spring, their growth is greatly excited by the heat, which their roots and stems receive from the flue. Air is generally admitted at the ends only, where all the sashes are made to slide, to afford a free passage of air through the house, when necessary, to prevent the Grapes becoming mouldy in damp seasons. About four feet of the upper end of every third light of the roof, is made to lift up, (being attached by hinges to the wood-work on the top of the back wall) to give air in the event of very hot and calm weather; for I prefer giving air by lifting up the lights, to letting them slide down, because when the former method is adopted, no additional shade is thrown on the plants.

The preceding plan is here particularly recommended for a Vinery only; but I am confident that by sinking the front wall below the level of the ground, and making a small change in the form of the bark-bed, the same elevation of roof may be made equally applicable to the pine stove, and that no upright front glass, ought, in any case whatever, to be used; for light can always be more beneficially admitted by adding to the length of the roof, if that be properly elevated; and much expense may be saved both in the building, and in fuel. For forcing the Peach or Nectarine, I must, however, observe that I think any house of the preceding dimensions wholly improper; and I propose to submit a plan for the

improved culture of those fruits to the Horticultural Society at a future opportunity.

The Vine often bleeds excessively when pruned in an improper season, or when accidentally wounded, and I believe no mode of stopping the flow of the sap is at present known to gardeners. I therefore mention the following, which I discovered many years ago, and have always practised with success: if to four parts of scraped Cheese be added one part of calcined Oyster shells, or other pure calcareous earth, and this composition be pressed strongly into the pores of the wood, the sap will instantly cease to flow: so that the largest branch may of course be taken off at any season with safety.

Fig. 1.

Fig. 2.

Fig. 1. Peaches and Nectarines on the same branch.

Fig. 2. A Fruit partaking of the Character of Peach and Nectarine.

XVII. *A short Account of* Nectarines *and* Peaches *naturally produced on the same Branch. By* Richard Anthony Salisbury, *Esq. F. R. S. &c.*

Read May 3, 1808.

Though it has long been known, that *Nectarines* and *Peaches* are sometimes naturally produced, not only upon the same tree, but upon one and the same branch, I do not find the fact recorded by any author; and having last year met with two instances, I presume to offer a short history of this anomaly to the Horticultural Society. Whether the remarks it has suggested are right or wrong, I leave to be determined by more able physiologists.

The first instance, of which I believe any tradition has been handed down, will be found in a letter of the late Peter Collinson, Esq. to Linnæus, which was read at the last meeting of the Linnean Society. He there, after giving an account of a supposed adulterous intercourse between two Apple trees, standing near each other, one of which in consequence bore both smooth and rough fruits, mentions a Peach tree, that produced Peaches and Nectarines.

The second instance occurred in Yorkshire, at Londesborough, then the residence of the Earl of Burlington; it made so much noise at that time, which was previous to the death of that famous gardener, Thomas Knowlton, as to be visited by the late Dr. Richardson, and many other horticulturists of that extensive county.

The third instance is commemorated in a painting by the celebrated EHRET, now in the possession of Messrs. LEE and KENNEDY: being accompanied with a dissection of the two fruits, which are the Alberge jaune, sometimes called the Orange Peach, it is very satisfactory.

The fourth instance was noticed more lately in the garden of WILLIAM GILPIN, Esq. at East Sheen; of this likewise a painting, but without dissections, has been made by Mr. HOOKER, nor can I from it ascertain the variety.

The fifth instance was discovered early in June last, in the garden of Sir JOHN ARUNDEL, at Huntingdon: having never seen one, I went there immediately, and after detaching the branch carefully from the wall, soon satisfied myself, that no bud had been inserted: there was, however, only a single Nectarine upon the tree, which the gardener said was the Belle Chevreuse, and a pretty accurate sketch of the branch is annexed.

The sixth instance was in Mr. WILMOT's garden at Isleworth, which I also saw in August last, and learnt that his tree, which is the Royal George, seldom fails to produce fruits with both smooth and downy coats, or in fact Peaches and Nectarines: two only of the latter then remained, and had been much damaged by snails.

I forbear to recite any others, these being more than sufficient to establish the fact: but my enquiries fortunately terminated with the singular example now exhibited, of both fruits joined in one. I have to thank Dr. BATTY for it, who accidentally observed it among a number of Peaches sent to him by JAMES WYATT, Esq. from the neighbourhood of Hounslow, during our vacation, and as it was already

beginning to decay, this only method of preserving it in spirit of wine, for the inspection of the Society, was not neglected.

Most of the gardeners with whom I have conversed respecting these anomalies, attribute them to the Pollen of neighbouring Nectarine trees brought by Bees: but, as the young fruit is smooth and downy, long before it is impregnated, that cannot be the cause, and in my humble opinion, no change of this sort is produced subsequently. Not that I have a shadow of doubt of the important consequences which ensue, when the Stigma of one plant imbibes Pollen belonging to another; but these are only manifested in the succeeding generation. The great Linnæus, in the *Plantæ Hybridæ* and *Generatio Ambigena* of his *Amœnitates Academicæ*, first promulgated a doctrine which I firmly believe, that varieties, species, and even genera, have been created in this manner; and without the fullest comprehension of it no gardener can hope to be successful in raising new vegetables, free from the faults, or endowed with the perfections he wishes. The pith of Linnæus's theory is, that the new vegetable will resemble its father, or that from which the Pollen came, in stem and leaves; but its mother, or that upon which the Stigma is situated, in flowers and fruit; this idea, which, somewhat less restricted, has been confirmed by actual experiments, should never be forgotten. Of the necessity of a sexual intercourse, every one who has raised a Cucumber or Melon is well convinced, and as far as the annual production of those or other fruits is concerned, I have nothing to hint in addition to modern practice, except that the Pollen of all vegetables might probably be preserved from one year to another; in early forcing, it would be found very useful, and should be

kept in papers as dry as possible, not applying it till the Stigma is moistened with its own natural exsudation. In those countries where Dates are the principal food of the inhabitants, a famine would sometimes be the consequence of neglecting this precaution; for the male trees do not flower every year, and it is well authenticated, that Pollen of the Palm performed its office successfully, after being sent many miles by the post, to Berlin.

Other plants sport in their pubescence as remarkably as the Peach, but being of less importance, are not attended to. Two years ago I observed a Wall-flower-leaved Stock with both smooth and downy leaves, in Messrs. Whitley and Brame's nursery. The common Ling, of which our besoms are made, varies in the same way; and the Teucrium Hetero-phyllum takes its name from this very circumstance. I conclude therefore, that all these variations proceed from laws in vegetation, of which we are yet ignorant, but which are immediately connected with the transudation of the sap through the cuticle, and it is possible, that this may even affect the flavour of two fruits upon the same branch.

XVIII. *An Account of a Method of* hastening *the Maturation of* Grapes. *In a Letter to the Right Hon. Sir* Joseph Banks, *Bart. K.B. P.R.S. &c. By* John Williams, *Esq.*

Read May 3, 1808.

Sir,

It is a fact well known to gardeners, that *Vines*, when exposed in this climate to the open air, although trained to walls with southern aspects, and having every advantage of judicious culture, in the ordinary course of our seasons ripen their fruit with difficulty. This remark, however, though true in general, admits of some exceptions, for I have occasionally seen trees of the common White Muscadine, and Black Cluster Grapes, that have matured their fruit very well, and earlier by a fortnight or three weeks, than others of the same kinds, and apparently possessing similar advantages of soil and aspect.

The Vines that ripened the fruit thus early, I have generally remarked, were old trees having trunks eight or ten feet high, before their bearing branches commenced. It occurred to me, that this disposition to ripen early, might be occasioned by the dryness and rigidity of the vessels of the old trunk, obstructing the circulation of that portion of the sap, which is supposed to descend from the leaf. And to prove whether or not my conjectures were correct, I made incisions through the bark on the trunks of several Vines growing in my garden, removing a circle of bark from each, and thus leaving the naked alburnum above an inch in width com-

pletely exposed ; this was done in the months of June and July. The following autumn the fruit growing on these trees came to great perfection, having ripened from a fortnight to three weeks earlier than usual : but in the succeeding spring, the Vines did not shoot with their accustomed vigour, and I found that I had injured them by exposing the alburnum unnecessarily.

Last summer these experiments were repeated : at the end of July and the beginning of August, I took annular excisions of bark from the trunks of several of my Vines, and that the exposed alburnum might be again covered with new bark by the end of autumn, the removed circles were made rather less than a quarter of an inch in width. Two Vines of the White Frontiniac, in similar states of growth, being trained near to each other on a south wall, were selected for trial ; one of these was experimented on (if I may use the term), the other was left in its natural state, to form a standard of comparison. When the circle of bark had been removed about a fortnight, the berries on the experimented tree, began evidently to swell faster than those on the other, and by the beginning of September showed indications of approaching ripeness, while the fruit of the unexperimented tree continued green and small. In the beginning of October the fruit on the tree that had the bark removed from it was quite ripe, the other only just began to show a disposition to ripen, for the bunches were shortly afterwards destroyed by the autumnal frosts. In every case in which circles of bark were removed, I invariably found that the fruit not only ripened earlier, but the berries were considerably larger than usual, and more highly flavoured.

The effects thus produced, I can account for only, by

adopting Mr. KNIGHT's theory of the downward circulation of the sap, the truth of which these experiments, in my opinion, tend strongly to confirm. I therefore imagine by cutting through the cortex and liber without wounding the alburnum, that the descent of that portion of the sap which has undergone preparation in the leaf is obstructed and confined in the branches situated above the incision; consequently the fruit is better nourished and its maturation hastened. It is certainly a considerable point gained in the culture of the Vine, to be able to bring the fruit to perfection, by a process so simple, and so easily performed. But lest there should be any misconception in the foregoing statement, I will briefly describe the exact method to be followed by any person, who may be desirous of trying this mode of ripening Grapes. The best time for performing that operation on Vines growing in the open air, is towards the end of July, or beginning of August; and it is a material point, not to let the removed circle of bark be too wide: from one to two eighths of an inch will be a space of sufficient width; the exposed alburnum will then be covered again with new bark before the following winter, so that there will be no danger of injuring the future health of the tree.

It is not of much consequence in what part of the tree the incision is made, but in case the trunk is very large, I should then recommend, that the circles be made in the smaller branches.

It is to be observed that all shoots which come out from the root of the Vine, or from the front of the trunk situated below the incision, must be removed as often as they appear, unless bearing wood is particularly wanted to fill up the

lower part of the wall, in which case one or two shoots may be left.

Grapes growing in forcing houses are equally improved in point of size and flavour, as well as made to ripen earlier by taking away circles of bark : the time for doing this, is when the fruit is set, and the berries are about the size of small shot. The removed circles may here be made wider than on Vines growing in the open air, as the bark is sooner renewed in Forcing Houses, owing to the warmth and moisture in those places. Half an inch will not be too great a width to take off in a circle from a vigorous growing Vine, but I do not recommend the operation to be performed at all on weak trees.

I think that this practice may be extended to other fruits, so as to hasten their maturity, especially Figs, in which there is a most abundant flow of returning sap; and it demonstrates to us, why old trees are more disposed to bear fruit than young ones. Miller informs us, that the Vineyards in Italy are thought to improve every year by age, till they are fifty years old. It therefore appears to me that nature, in the course of time, produces effects similar to what I have above recommended to be done by art. For, as trees become old, the returning vessels do not convey the sap into the roots, with the same facility they did when young; thus by occasionally removing circles of bark, we only anticipate the process of nature; in both cases a stagnation of the true sap is obtained in the fruiting branches, and the redundant nutriment then passes into the fruit.

I have sometimes found, that after the circle of bark has been removed, a small portion of the inner bark has adhered to

the alburnum: it is of the utmost importance to remove this, though ever so small, otherwise in a very short space of time, the communication is again established with the root, and little or no effect produced. Therefore, in about ten days after the first operation has been performed, I generally look at the part from whence the bark was removed, and separate any small portion, which may have escaped the knife the first time.

I am, Sir,

Your obedient humble Servant,

JOHN WILLIAMS.

Pitmaston, Worcestershire,
20th April, 1808.

XIX. *Observations on the Culture of the* Dahlias, *in the northern Parts of* Great Britain, *&c. In a Letter to* Richard Anthony Salisbury, *Esq. F. R. S. &c. By* John Wedgwood, *Esq. F. H. S.*

Read November 1, 1808.

Dear Sir,

Thinking that a few practical remarks on those highly beautiful flowers, the *Dahlias*, in a climate more severe than that about London, will not prove unacceptable, I offer the following to your perusal; should they in your opinion tend to give a truer notion of their culture, you will perhaps communicate them to the Horticultural Society.

I consider these plants about as hardy as the Potatoe, and have no doubt that in Devonshire, they may be quite naturalized. Here in Staffordshire, however, our winters are colder and longer, as well as the aggregate heat of summer less.

In the spring of 1807, I became possessed of three small plants of the Sambucifolia, v. ε. purpurea, Bidentifolia, v. α. crocata, and Bidentifolia, v. β. coccinea, in pots. About Midsummer I planted them in an open border, in a stiff clayey soil; they grew very fast, but had not flowered, when a sharp frost, about the middle of September, quite destroyed their foliage. They were immediately taken up, potted, and removed to a conservatory, where they continued vegetating during the whole of winter without shewing any appearance of flowers.

In the middle of May, 1808, they were planted out in a

border, in front of the conservatory, of light sandy loam enriched with rotten leaves and dung. The Bidentifolia, v. β. coccinea, continued in an uninterrupted state of growth, but the two others had suffered a great check, and lost their main stem. All of them now grew rapidly, being regularly watered as they appeared to want it, and on the 16th of July, I first remarked flower buds, appearing upon all of them. The Bidentifolia, v. β. coccinea, opened its first flowers the last week in that month, and was completely covered with them during August and September. The other two plants were later, and expanded fewer flowers, but were much more luxuriant in their growth, being at least seven feet high, and full of foliage, whilst the Bidentifolia, v. β. coccinea, was not more than four feet high, and much less luxuriant in its foliage.

On the 28th of *September* we had a sharp frost, and on the 29th, the cold increasing with a heavy fall of snow, my plants were completely cut down to the ground. On the 1st of October they were taken up, potted, and planted in the conservatory for the winter. Being present at this operation, I remarked what will, perhaps, fully account for their difference in flowering. To the stems of those which had made luxuriant foliage and few flowers, large tubers adhered, similar to those of the Pæony, and very different from their roots, but upon the plant which had flowered so abundantly, not even one tuber was formed. I have separated the tubers, and hope that each of them will next spring produce a flowering plant. I was fortunate enough to obtain a good deal of ripe seed of the Bidentifolia, v. β. coccinea, by drying the heads gradually in a hothouse, after they were gathered upon being cut down by the frost.

Had I seen your paper on this subject, before I planted them out in May last, I have no doubt I should have had both more flowers and those earlier, a point of great consequence in obtaining their seeds, but I think it probable that when planted in a poor gravelly soil, no tubers whatever will be formed.

I met with an instance, something similar to this formation of tubers, last spring, on a decaying leaf of an Ornithogalum. I do not know the name of the species, or even if it is described, the bulb being given to me by a gentleman, who brought it from the Cape of Good Hope. This curious plant vegetates and flowers one year, but remains dormant the next, not producing even leaves; last year it flowered early in the spring, and when the stem and leaves were decayed, I observed the ribs of one of the leaves covered with small bulbs. Were not these produced by the superabundant alburnum, which had not an opportunity of wasting itself in forming seeds, for I regularly cut off the flowers, from the lower part of the spike as they withered?

I remain yours, &c.

John Wedgwood.

Etruria, Staffordshire, Oct. 22, 1808.

XX. *Hints relative to the Culture of the* Early Purple Brocoli, *as practised in the Garden of* Daniel Beale, *Esq. at* Edmonton. *By Mr.* John Maher, *F. H. S.*

Read December 6, 1808.

Few vegetables have been more improved of late years than *Brocoli*, so that it now almost equals in flavour and magnitude the delicate Cauliflower, over which it has the decided advantage of being more hardy, and may, by a little management, be procured through the whole winter.

Several varieties, differing in colour from white to deep purple, are sold by our nurserymen; and as all plants of this natural family, become less alkalescent and more palatable, in proportion as they approach to a pale or white colour, such varieties will undoubtedly be preferable to purple ones, if they turn out equally hardy: nor are we to despair of raising them, by patience and perseverance in selecting the largest and whitest specimens of the common Brocoli, for seed.

All attempts of this kind, however, demand both a long time, and no trifling expense, nor can they be easily prosecuted, except in the insulated grounds of those gentlemen, whose liberality, like that of my master, rivals their extensive possessions: for, out of a great number of plants set apart for seed, perhaps not even one may answer our wishes, and if a brisk * gale of wind, or wandering bees, bring

* The result of an action for damages brought in Westminster Hall more than a century ago, against an innocent but unfortunate gardener, for selling

the Pollen of any other variety to their flowers, the progeny in ninety-nine instances out of a hundred, will be deteriorated instead of improved, and in no case prove the identical variety sown.

The Brocoli, of which I am now emboldened to offer some account to the Horticultural Society, is reported to have been introduced from the Cape of Good Hope, by the Hon. MARMADUKE DAWNAY, and first cultivated in Surrey, where it is called the *Early Cape Brocoli.* Packets of seed, first sent here from Italy, which appear to me to have produced the same variety, have also been sold for two seasons by Mr. GRANGE, fruiterer, in Covent Garden and Piccadilly: it may therefore easily be obtained, and our principal care now, must be to preserve it, in its present magnitude and excellence.

My method of treating it is as follows. Three crops are sown annually: the first between the 12th and 18th of April: a second between the 18th and 24th of May: the third between the 19th and 25th of August: these successive crops supply the family from September till the end of May.

The seeds are scattered exceedingly thin, in a border of very rich light earth. Not a weed is suffered to appear, and when the young plants have from eight to ten leaves, which happens in about a month, they are finally planted out at the distance two feet every way, in a piece of sandy loam, which has been well prepared for the purpose by digging, and enriched

Cauliflower seeds, which only produced long-leaved Cabbages, has been stampt with immortality by the pen of LINNÆUS, in his celebrated treatise on the sexes of plants, the *Sponsalia Plantarum,* and confirms this remark.

with a large proportion of very rotten dung, frequently turned over to pick out every sort of grub, or insect deposited in it. The ground is kept constantly clean by hoeing, whenever a seed leaf of any weed springs up, and the loose surface is drawn together into a heap, round the stem of each plant.

The second crop is treated exactly as the first, but the weaker plants left in the seed bed, are permitted to remain eight or ten days longer to gain more strength. They are then transplanted into pots of the size called sixteens, filled with very rich compost, placing them close to each other in the shade, and duly watering the plants, till they begin to grow freely. After this, the pots are plunged in the open ground at two feet distance from each other, every way, and about three inches under the general level, leaving a hollow or bason round each plant, to retain any water given to them when necessary. By the time the pots are filled with roots, and that autumnal rains render watering unnecessary, the basons are filled up by drawing the earth round each plant, at the same time pressing it firmly down to prevent the wind from shaking them. A few of these plants in pots sometimes shew flowers too soon, and to guard them from early frost, a leaf or two is broken down over them. On the approach of settled frost in December and January, all the pots are taken up and removed to a frame, pit, or shed, where they can be sheltered from the extreme severity of the winter, but have air when it is milder, and by this method a supply is preserved for the table in the hardest winters. To make Brocoli succeed in pots, I find by experience, that it should be potted immediately from the seed bed. If it is transplanted oftener, the head or flower

is both less in size, and runs much sooner after it forms. For the same reason, I never prick out or transplant the general crops; and as the temperature of our climate does not suffer vegetation to go on briskly from October to March, by following this method, the heads of flower will remain a long time in a state of rest after they are formed, without bursting; and heads from six to seven inches diameter are the ordinary produce of our plants.

The seeds of the third crop are sown in a frame, or under hand glasses, and about the third week in October, the plants become strong enough to remove, as in the two former crops. From this sowing, the best plants are selected for seed, and placed three or four under a hand glass, according to its size; three however, are sufficient, for they should not afterwards be disturbed. They are gently watered and covered till they have made fresh roots, after which air is plentifully admitted, and they are treated through the winter exactly like Cauliflower plants. From the hints already given, it may be deduced, that the plants intended for seed should not only be placed in a part of the garden, remote from every other variety of the Cabbage tribe, but that no plant whatever of any variety, should be suffered accidentally to shew even a flower in the garden; and this business, when two or three hot days in the months of May and June often produce the effects of apparent enchantment, by suddenly bringing Radishes, Turnips, Borecole, Cabbages, Sea Kale and Cauliflowers, into bloom, requires very strict attention on the part of the gardener.

XXI. *An Account of the* Burr-knot Apple. *In a Letter to* Henry Grimston, *Esq. F. H. S. By the Rev.* John Simpson.

Read Dec. 6, 1808.

My Dear Sir,

Your letter met me on my return home after a month's ramble among the mountains and lakes in Cumberland, and I now send you a short description of the *Apple Tree* called here the *Burr-knot*. At a proper season I will forward to you a few knots, or knobs of it for trial, which, put into the ground, will make a long shoot the following spring; or if you wish it, I will send you a few knobbed branches with blossom buds upon them, which will bear a little the same year, but you must observe the smaller knobbed branches with blossom buds will not make such fine or handsome trees as the others.

The Burr-knot * Apple tree is uncommonly productive. My trees never miss bearing, not being so liable to blight in inclement seasons, as other varieties. The fruit is large, its tints resembling the Ribston Pippin, and it is nearly of the same size. For culinary uses, it is not inferior to the choicest Codlin, and is a much better keeper. The tree is not liable to canker, owing, I am persuaded, to its not putting out a

* Specimens of the fruit, and branches of this Apple tree from Rooss, which is also plentiful in Lord Hawkesbury's garden at Combe, were exhibited at the meeting of the Society, when this Paper was read.

tap-root, but spreading its numerous fibres from the knob horizontally, and following the richness of the soil.

Our late worthy and valuable friend, Sir CHRISTOPHER SYKES, observing my trees of one year's growth with fruit upon them was astonished, and the following year had the pleasure of exhibiting some of the knobbed branches which I gave him, adorned with fruit, in his own garden, to his friends, of which you have probably been an eye-witness, having visited so frequently in his time at Sledmere. If you wish for any other information that I can give respecting this Apple tree, I shall be happy to send it, and remain, dear sir,

Yours very truly,

JOHN SIMPSON.

Rooss, near Patrington, July 25th, 1808.

XXII. *On the Cultivation of* Crocuses, *with a short Account of the different Species known at present. By* Adrian Hardy Haworth, *Esq. F. L. S. &c.*

Read February 7, 1809.

The Horticultural Society having wisely determined to advance the knowledge of both ornamental, and esculent plants, the author of this paper has long meditated to lay before them a detail of the beautiful Genus *Crocus*, and its mode of culture; which at length he ventures diffidently to bring forward. That it merits their attentions, will readily be admitted; directed, as those attentions are, equally to the pleasure of the peasant, and the prince; showering alike the knowledge communicated to them over all mankind.

Crocuses are universally admired, annually gilding with vegetable blue and gold, the borders of almost every garden. Besides their season of bloom occurring in early spring, proves much more acceptable than it would at any other time; for at that unsettled period of sunshine, or gloom; of frost, or snow; few are the subjects of Flora, who venture to open their fair bosoms to the sun: and none of these are calculated to vie with the charming species of this Genus. Companions of their early precursor, the modest Snowdrop,· sweet emblem of drooping merit, and humility;

they appear to the greatest advantage in its company, where its icy charms serve but as a foil to their gayer colours.

Hence they are commonly found planted together, and carefully fostered, from age to age, along with Daffodils, and Tulips; Polyanthuses, Primroses, and Auriculas; Anemonies, and the earlier sorts of Hyacinths: lovely, fragrant assemblages, affording salubrious employment to declining years: and thus descending in complete security from one generation to another:—from those memorable days in the annals of British Horticulture, the days of GERRARD and JOHNSON, to those of PARKINSON and his earthly Paradise:—thence passing safely through those still more estimable ones of MILLER, "*Horticultural Prince*," down to our own. But for the laudable and happy care of these venerable gardeners, various other vernal beauties of the bulbous tribe, which adorned in such profusion, the gardens of our forefathers, would never have flourished in ours; and many varieties, which their industry had raised from seeds, appear, even as it is, irretrievably lost to us. But to cease digressing, and return to the more immediate object of this paper.

It is not my intention to give a complete history of this Genus with all its synonyms, &c. or any very minute description of its several species; for such a performance would occupy far more time, than I can at present spare. I shall therefore only briefly recite the species known to me, with an improved mode of raising new varieties of these plants from seeds; and of cultivating and encreasing the old ones.

Not fewer than thirty seasons have revolved since these

vernal beauties became the objects of my horticultural assiduity: and every succeeding year has added something to my knowledge of their propensities, and distinctions: having at various intervals raised an immense number. Nevertheless, in the course of collecting their seeds I have with surprise perceived, that those of the blue, purple, and white flowered kinds alone, ripened with me. For I never observed either a single capsule from a yellow* one, or raised a single seedling with the least tint of that colour, in any part of its petals. In nature, therefore, it should appear, that some inexplicable distinction exists between the yellows, and the other species. The leaves of the yellows, likewise, are much narrower throughout every species and variety.

With respect to the culture of these plants, it shall be treated of from the seed upwards, to the age of maturity, or flowering: this occupies a period of from three to four years. Being of the bulbous kind, the seeds of Crocuses should be gathered as soon as they have ripened; which is denoted by the partial splitting of their capsules at the top, as well as by their pale and dry appearance, and by the large reddening seeds themselves becoming more or less visible between the capsular fissures. This happens sometime in the month of June, about the period of the annual exsiccation of their leaves.

It may be worthy of remark in this place, that the capsules of Crocuses are excluded in a manner widely different from that of most other vegetables. They are not, as usual,

* The yellow flowered Crocuses, except the species with very small anthers, have been observed in other gardens to ripen seeds, and in some seasons very plentifully. *Secr.*

visible in the base of the flowers, at the time of flowering, in the incipient state of what LINNÆUS has so improperly called a germen; being at that period secluded from the reach of the eye, hidden far beneath the soil, near the very bulb, at the base of the long, and at that time almost sessile tube of the corolla. For it is not until long after the total decay of the flower, that the swoln capsule emerges upon a real white peduncle above the surface of the earth. This extraordinary mode of semination, is still more conspicuous in Colchicum, the flowers of which are seen in autumn unaccompanied even by leaves, the latter not appearing until the spring following, folding in their fostering bosoms the large, unwieldy, pregnant capsules. Even in the present subject of this essay, one solitary species, and that a British one, observes the same fashion; viz. Crocus nudiflorus; flowering without leaves in autumn, which it throws out along with the fruit in spring.

The seeds of Crocuses are best sown immediately after being gathered, in light, dry earth, that will neither bind nor retain moisture long: but it is not necessary that it should be rich; as that might encourage a too redundant, and fatal humidity. Large pots, or pans, or small shallow boxes of such soil, with a sufficiency of holes and potsherds at the bottom, for the purpose of draining off with certainty, all superfluous moisture, are the properest receptacles for these seeds; which should be sown thinly (for almost every one will vegetate), and not covered at the time of sowing more than half an inch with the mould.

The most eligible aspect, or situation, for the seed boxes, until the autumnal rains set in, is a moderately shady,

yet unsheltered spot; permitting them to receive all the influence of the weather, except such heavy showers as would wash bare the seeds. As soon, however, as the autumnal rains commence, it will be highly advantageous to remove the boxes to a warm aspect: and to protect them from all excessive rains, frosts, and snows, by the occasional shelter of a garden frame: allowing them, nevertheless, the benefit of the full air, at other times; but more especially after the seminal* leaf (for they have but one, being monocotyledonous plants), eager to commence the career of life, urges its fine setaceous point above the surface of the earth. This occurs sometimes about the end of the year; but oftener in earliest spring. After this, their birth, if I may use the expression, it is quite essential that they should have complete exposure to the air, even in frosty weather; for they are prodigiously hardy with respect to cold; screening them, however, occasionally, like early Radishes, with loose straw, from other injurious effects of frost: so as to prevent their being raised out of their infantile beds by its baneful effects. But remove all the straw-covering again, as soon as the frost is over.

In this manner may the young Crocuses be treated until the sun acquires sufficient power to dry the earth in the boxes, so as to require daily waterings: for they must have gentle rose-waterings, whenever they are quite dry. It will be then found advantageous to remove them to a cooler, but not sheltered situation, and here they may remain until their leaves die down; giving them, as just hinted, at all times,

* A figure of the seminal leaf and bulb of Crocus Lagenæflorus with a magnified transverse section of the former is shewn in Plate VI.

and in every situation, while their leaves are growing, such discretional rose waterings, when the sun is not shining, as they may reasonably appear to require: but never until the earth they grow in becomes dry: nor any whatever, after their leaves begin to look yellow. After this period, it is necessary to defend them from all humidity, except dews, and gentle rains, until the end of August or beginning of September.

From weeds, worms, slugs, and snails, it is almost needless to observe, they should constantly be kept as clear as possible. And if the surface of the earth in their boxes is occasionally stirred with the point of a knife, or fine piece of stick, it will never fail to be attended with beneficial effects, and to invigorate the bulbs: operating, no doubt, as a sort of hoeing, and like that important practice, as the writer of this paper conceives, proving salubrious to vegetables of every denomination, not only by lightening the soil, but by admitting new accesses of atmospheric air towards their roots; and thereby facilitating, and stimulating their absorbent inspiration of its oxygen: without a due supply of which, all vegetables, as well as animals, eventually become feeble and sick.

If, notwithstanding the precaution of thinly sowing the seeds, the plants in any of the seed boxes should have grown so thickly together, as to have incommoded each other, it will be desirable to have such taken up; and replanted immediately, further asunder, in fresh earth, and about three quarters of an inch deep. But if they are not too crowded, they will require no shifting this, their first autumn; but merely about a quarter of an inch of fresh

mould should be sifted over them, previously stirring the surface of the old, and cleaning from it the moss and weeds; observing not to bury the young bulbs, not yet so large as lentils, deeper than three quarters of an inch, or an inch at the most.

The second season requires exactly the same management as the first. But as soon as their second year's foliage has passed away, the roots should all be taken up, and replanted again the same or following day, into fresh earth, of the same kind as before, about an inch deep, and as much apart; and often treated as above.

Nor does the third season demand any alteration in their management; but it is advisable to sift over them in autumn half an inch of fresh earth.

The spring following, if they have been duly attended to, most of them will shew flowers (a few, perhaps, having done so the season before) in the midst of their fourth crop of leaves; fully rewarding with the cheering colours of their new faces, all the preceding assiduity and care; for notwithstanding three years and a half have rolled away under its slow progress; yet it must not be forgot, for it is too encouraging to be omitted, that he who sows annually fresh seeds, also reaps annually fresh blossoms, and acquires before-unheard-of varieties of these little charmers: which like the sportive Tulip, surprise and delight his eyes, not less with the variety than with the feathery gaiety of their colourings: or even their still more acceptable early appearance; chasing away, as it were, or pushing before them, the melting snows of lingering winter; and thence announcing the sure approach of that welcome season, lovely spring.

There is hardly a man who is not naturally fond of flowers, and gardening, at this incipient season of promise; even those who tire and relax, when hotter suns prevail.

The seedling plants, after they have flowered, may, to all intents and purposes, be considered and treated as old ones: and after their leaves have passed once more away, may be taken up, and replanted permanently, in the open borders of the garden, at about two inches apart, and as many deep; they may be placed as fancy requires, either in groups, patches, edgings, or full beds; and will flower strongly the ensuing spring.

Although Crocusses certainly prefer a light dry soil, and warm aspect, yet most of them will thrive in any soil or situation; and are well adapted to the little narrow borders of cottage gardens, where they are accordingly often found.

The early kinds, in mild seasons, commence flowering about the end of January, and the latest sorts are visible until the end of April, or beginning of May, but their chief season is March.

When the old roots are taken up, and it is proper to do so to part and increase them at least every third year, after the periodical decay of the leaves, they may, if required, be kept out of the ground, with other bulbs, until *Michaelmas*, but not later; for the longer they are out, the weaker they become; and there is, perhaps, no advantage whatever arising from this practice, except that it dries them sufficiently to admit of the easy separation of their old, dead root-coats, from the new ones: for I have not, as in Tulips, ever observed the more delicate and feathery-striped varieties return,

or, as it is (improperly enough) termed, degenerate into *self* colours. Those which have been kept out of the ground the longest, will, as might be expected, flower the latest; and by planting some of the stoutest of such, in cold northern situations, and as deep again as usual, an agreeable artificial protraction of their blooming is occasionally produced, some weeks later in the season than would otherwise occur. They likewise admit of having their flowers accelerated by forcing, in the usual way: but this weakens the roots so much, they cannot bloom again the following year.

Innumerable forced pots of Crocuses are seen annually exposed to sale in Covent Garden, along with other vernal flowers; and a sort of pot called a Hedgehog, also often appears amongst the others. It is made in the shape of that quadruped, but full of holes, and filled with earth; and one large Crocus root is placed internally, in the front of every hole; the bristling leaves of which, shooting through the holes, represent grotesquely enough, but not unaptly, the spines of the animal. But I have seldom observed these crocine hedgehogs produce many flowers. This, however, may arise from their not receiving a sufficient supply of water; and if so, admits of the most easy remedy, by occasional immersion of the whole Hedgehog in a vessel of water. I have also flowered the larger bulbs of Crocuses in glasses of water, after the manner of Hyacinths: but in this way they produce only a scanty bloom.

Notwithstanding Crocuses have been cultivated universally as ornamental plants, both in this country, and on the continent, from the most early ages of gardening, still their specific distinctions, botanically speaking, are even now but imper-

fectly understood : no regular enumeration of the species having ever appeared.

This in some measure arises from that great Botanist LINNÆUS having most injudiciously reduced them to one species only ; notwithstanding our own immortal Gardener, MILLER, had long before, in his matchless *Dictionary*, very satisfactorily described four species.

However, the new editor of his *Species Plantarum*, Professor WILLDENOW, admits two distinct Crocuses in that edition. And the President of the Linnean Society, figures and describes three, as natives of Great Britain. Others also have since appeared in the *Botanical Magazine*, and *Paradisus Londinensis*. Long ago I named and described all the species and varieties enumerated in this paper, for the purpose of publication ; my names are therefore here preserved ; although some of the plants have lately been given to the public, under different appellations.

I now proceed to a regular definition of all the species of this Genus known to me, in scientific language ; dividing them into two sections ; and the first of these again, into two subdivisions ; from diversities observable in the conformation of their flowers ; or the periods of their producing them: as follows.

CROCUS.

Ordo Naturalis.

Irides. *Juss. Gen. Pl.* 59.

Sect. II. Stamina, filamentis distinctis.

Character Generis.

Corolla supera, limbo altè sexfido, subæquali ; laciniis erecto-patulis, convexo-concavis ; tubo longissimo, semi-subterraneo. Stigmata tria, prægrandia, convoluto-cuneata apice eroso-laciniata.

Plantæ humillimæ. Radix bulbo-tuberosa, annua ; florescens duplex, bulbo-tuberibus superimpositis. Stipulæ subnumerosæ, plerumque subterraneæ, spathæformes. Folia radicalia, multifaria, sæpe semicruciato-linearia, viridia, glabra, costâ albâ ; ante anthesin mediocria, suberecta ; post florescentiam longa, patenti-effusa ; demum longissima. Spathæ 1-3 *phyllæ*, 1-3-*floræ. Flores sessiles, germine subterraneo ; sed capsula matura elevata supra terram est, pedunculo debili albo. Semina magna, rotunda, submollia, rufa.*

Characteres Sectionum.

1. Vernales, floribus vernalibus.

   † *Piligeri*, tubo corollæ superne pilis clauso, laciniis, stylo, filamentisque, absque tincturâ flavedinis; foliis anguste linearibus.

   †† *Depilati* tubo corollæ nudo laciniis undique, vel basi, genetalibusque, plus minus flavis : foliis angustissime linearibus.

2. Autumnales, floribus autumnalibus.

Characteres Specierum.

† *Piligeri.*

1. Vernales.

1. Crocus, (The *Vernal Blue*) corollæ laciniis lanceolatis, basi attenuatis, imbricatis. *Vernus.*

Crocus vernus. *Engl. Bot. tab.* 394. Crocus vernus β *Gawler in Bot. Mag.* n. 860. *cum Ic.*

Habitat, in *Anglia* juxta *Nottingham.*

Floret, Februario, Martio.

Variat mire latitudine et colore laciniarum corollæ.

2. Crocus, (The *Egg-shaped*) Corollæ laciniis rotundato obovatis, inflato-incurvis, lateribus alte imbricatis: Stigmatibus latissimis. *Obovatus.*

Habitat——

Floret Martio.

Descriptio. Corolla obtusissima omnium, laciniis magis inflato-incurvis.

Variat corollis albis; variegatis; purpureis: atque vivacissime atropurpureis.

†† *Depilati.*

3. Crocus, (The *large Gold-coloured*) antheris recurvato-patulis subemarginatis, stigmatibus longioribus; filamentis subpubescentibus. *Floribundus.*

Crocus vernus. *Curtis in Bot. Mag.* n. 45. *cum Ic.*

Habitat——

Floret Februario, Martio.

Descriptio. Minime variat.

α. Corolla grandis, speciosa, aurea laciniis exterioribus dorso, tuboque supernè olivaceo obsoletè notatis; tunicis radicalibus striatis.

Crocus vernus. *Bot. Mag. tab.* 45. Nec Crocus vernus, *Eng. Bot.* vel *Sm. Fl. Brit.* qui diversissimus est.

Lagenæflorus. 4. Crocus, (The *lesser Gold-coloured*) filamentis pubescentibus supernè geniculatis, antheris incurvo-patentibus.

Crocus Lagenæflorus γ. *Salisb. Par. Lond.* t. 106. Crocus aureus. *Sibth. Fl. Græca, v.* 1. *p.* 25. *tab.* 35.

Habitat prope *Sestum*, arenosis argillâ substratis.

Floret Martio.

Descriptio. Præcedenti simillimus, at satis distinctus minorque. Variat.

α. Corollæ laciniæ peraureæ, valdè imbricatæ, obtusissimæ, concavo-incurvæ.

β. Corollæ laciniæ albicantes, basi (præcipue intus) flavicante. Stigmata flavicantia.

Crocus Lagenæflorus β. *Salisb. Par. Lond.* 106. Crocus mæsiacus β. *Gawler in Bot. Mag. n.* 1111. *cum Ic.*

Flos exsiccatus persulphureus est.

γ. Gracilior omni parte, quam α vel β; laciniis corollæ minus imbricatis, albis; interioribus basin versus, ad costam, flavicantibus; exterioribus a basi, fere ad medium, tuboque lætissimè prasino striatulis. Filamenta minus pubescentia, atque tenuiora quam in α, vel β.

Crocus Lagenæflorus α. *Salisb. Par. Lond.* 106.

Forte cum β, propria species.

Obs. I have never had an opportunity of cultivating any of the supposed varieties of this species. The above description of α, was made from two recent flowers, without leaves, given me by my friend Richard Anthony Salisbury, Esq. our Secretary, and they are all which I have seen.

The variety β, which will probably prove to be a species,

was also described from two not very fresh flowers, communicated to me by my friend Mr. DICKSON, of Covent Garden.

And the above account of γ, was likewise drawn up, from two or three flowers only; which were given me by Mr. WILLIAMS, Nurseryman at Turnham Green.

5. Crocus, (The *small Yellow*) corollæ laciniis lanceolatis, concavo-incurvis; stigmatibus antheras superantibus; foliis erectis, angustissimis. *Flavus.*

Crocus sulphureus. *Gawler in Bot. Mag. n.* 938. *cum Ic.* bonâ. Crocus vernus flavus striatus. *Park. Par.* p. 163. f. 10.

Habitat——

Floret Februario.

Descriptio. Variat.

α. Radix bulbo-tuber, tunicis glabris, scariosis. Folia pergracilia, numerosa, tempore florendi erecta, flore humiliora. Antheræ patulæ, subulatæ, exiguæ, et singularitèr quasi mpotentes; stigmatibus gracilibus multò breviores. Corolla, vel omnino flava; seu pallide aurea; sive laciniis exterioribus plus minus fusco-striatis, nitidis.

β. Radix tunicis glabris. Folia gracilissima acutissimaque omnium Crocorum, flores semper superantia. Corollæ laciniæ acutè lanceolatæ, valde inflato-concavæ, pallidissime stramineæ, sive albicantes fundo intùs filamentisque flavis. Antheræ exiguæ ut in α, patulæ, subulatæ, pallidè stramineæ. Stylus etiam stramineus. Stigmata antheras superantia, itidem straminea.

Obs. A living root of this variety in bloom, was communicated to me by Mr. WILLIAM ANDERSON, gardener to JAMES VERE, Esq.—The above description was made from it. Mr. ANDERSON assures me that the late Mr. CURTIS,

always pronounced it to be a distinct species, from all the Crocuses he was acquainted with.

Revolutus. 6. Crocus, (The *Cloth of Gold*) corollæ laciniis revolutis.
Crocus Susianus. *Gawler in Bot. Mag. n.* 652. *Cum Ic.*
Habitat——
Floret, fortè antè omnes, Januario, Februario.

Stellaris. 7. Crocus, (The *starry Cloth of Gold*) foliorum erecto-patulorum carinis obtusatis, lateribus enerviis; laciniis corollæ ad solem campanulato-stellatis.
Habitat——
Floret in Hortis, initio Martii.
Obs. The above incomplete description was taken from a single, weak, flower, (just beginning to decay,) and its accompanying leaves, communicated to me by our Secretary. The root I have not seen, but he informs me, that its coarse coats resemble those of C. revolutus in some points.

I have not found any account of this Crocus in authors, although PARKINSON has one in his *Paradisus* which approaches very near it, viz. "26. *Crocus vernus versicolor pallide luteus.* The pale Cloth of Gold Crocus." At a future opportunity, I hope to have the pleasure of laying before the Society a more satisfactory account of this, and of some other species: and in the mean time subjoin a figure with dissections of it, from a drawing by our Secretary.

Fragrans. 8. Crocus, (The *fragrant*) foliis recurvatim humi diffusis; stigmatibus elongatis, antheras superantibus; radice subconico glabro.

Crocus versicolor. *Gawler in Bot. Mag. n.* 1110. *cum Ic.* exclusis omnibus synonymis.

Habitat——

Floret Februario.

Descriptio. Variat.

α. Corollæ laciniæ purpurascentes, albo-striatæ fundo laciniarum utrinque flavo. Genitalia percrocea, stigmatibus antheras vix superantibus. Antherarum bases tenuissimæ, hamato-divaricatæ.

β. Folia semicruciata, latiuscula in hoc genere, nervo lato, albo, suprà, carinâque valde dilatatâ. Corollæ laciniæ albæ, fundo utrinque flavo, lanceolatæ; tribus exterioribus extùs elegantèr purpureo plumoso-striatis. Filamenta antheræque luteæ, stigmatibus paulo humiliora. Stylus atque Stigmata elongata, percrocea.

9. Crocus, (The *early striped*) foliis effusis flores semper superantibus, tunicis radicalibus circumscissis. *Circumscissus.*

Crocus biflorus. *Gawler in Bot. Mag. n.* 845. *cum Ic.*

Crocus (biflorus), *spatha biflora, corollæ tubo tenuissimo. Mill. Gard. Dict. ed.* 8.

Crocus biflorus. *Bot. Rep. vol.* 6. *tab.* 362. Scotch Crocus. *Hortulanis nostratibus.*

Habitat——

Floret Januario, Februario, fere antè omnes.

Descriptio. Radix tunicis glabris, singulariter circumscissis. Folia tempore florendi longissima omnium vernalium, valdè effusa. Spathæ sæpè biforæ, ut in plurimis. Flores albi, magni, fundo laciniarum intùs sordidè flavo, extùs parum olivaceo tubo prægracili. Corollæ laciniæ exteriores

extùs tincturâ flavedinis, et purpureo elegantissimè plumoso striatæ. Filamenta antheraque erectæ, luteæ. Stylus percroceus. Stigmata erosa, etiam percrocea, antheras vix superantia.

Obs. 1. When the sun shines strong upon the flowers of this species, they exhale a very slight, and not unpleasant odour: but all other Crocuses, fragrans alone excepted, possess an unpleasant scent.

Obs. 2. In describing the leaves of Crocuses as being erect, or not; or as being longer, or shorter than the flowers; it is merely meant that they are so, at the time their earliest flowers are in perfection. Afterwards they become much elongated and recurved.

Indeed the flowers of all bulbs, whether vernal or autumnal; and whether accompanied by leaves or not; may be fairly considered as *preceding* not *succeeding*, that is, following, the leaves; as is usually understood.

This is more especially manifest in the naked flowering kinds, such as Colchicums; whose flowers are annually produced, not very long after the periodical quiescence of the bulbs; by the earliest efforts of the new vegetation.

** *Autumnales, floribus autumnalibus.*

Nudiflorus. 11. Crocus, (The *naked-flowered*) floribus ante folia.
Crocus nudiflorus. *Eng. Bot. tab.* 491
Habitat in Anglia, juxta *Nottingham*.
Floret Octobri.

Serotinus. 12. Crocus, (The *late autumnal*) foliosus tempore florendi, stigmatibus erectis.
Crocus serotinus. *Salisb. Parad. Lond. tab.* 30.

Crocus Stellaris.

Crocus autumnalis. *Mill. Gard. Dict. ed.* 8. *No.* 2.
Habitat in *Portugal,* locis rupestribus haud procul a mari.
Floret Novembri.
Obs. MILLER enumerates three varieties of this very distinct, and very late-flowering species; only one of which (the paler blue-flowered) is known to me; its leaves are far shorter than those of any other *Crocus*: and very much lower than the flowers, at the time of flowering; which lasts until late in December.

13. Crocus (The *true Saffron*) stigmatibus longissimis pendulis. *Officinalis.*

Crocus sativus, *Spatha univalvi radicali, corollæ tubo longissimo. Mill. Gard. Dict. ed.* 8. *No.* 1.
Crocus officinalis. *Mart. Fl. Rust. tab.* 58.
Crocus autumnalis. *Eng. Bot. tab.* 343.
Habitat in Anglia, culta sub dio.
Floret Octobri, Novembri.
Obs. 1. Folia longissima, angustissima, effusa.
Nunquam variat.
Obs. 2. For the mode of cultivating this valuable plant for medicinal purposes, see MILLER's Dictionary, and other works.

References to the Plate of Crocus Stellaris.

1. Two flowers not yet expanded, shewing the insertion of the peduncles in the young root. 2. 3. The bractes at the bottom of the peduncles magnified. 4. Two views of a stamen before it bursts, magnified. 5. Two views of the root cleared of its old coats in the beginning of September, before it has pushed out any fibres. 6. The two outer coats of the root, in which it differs from every other species. 7. Young fruit magnified. 8. Stigmata magnified. 9. Pistillum. 10. Transverse section of the seed leaf of Crocus Lagenæflorus magnified. 11. A seedling plant of Crocus Lagenæflorus, natural size.

XXIII. *On the Horticultural Management of the* Sweet *or* Spanish Chestnut *Tree. By the Right Hon. Sir* Joseph Banks, *Bart. K. B. P. R. S. &c.*

Read February 7, 1809.

In all the northern parts of Europe, where *Chestnuts* are used for food, the practice of grafting the trees that bear them has been known from time immemorial; the wild or ungrafted Chestnut is called in French *Châtaignier*, the grafted or cultivated sort, *Maronnier*.

Though the grafting of Chestnuts has been little, if at all used in this part of the island, it is not an uncommon practice in *Devonshire*, and other western counties. The nurserymen there deal in grafted Chestnut trees, and the gentlemen have no doubt introduced them into their gardens.

About sixteen years ago, Sir William Watson sent some of these grafted trees from Devonshire to Spring Grove, with an assurance that the fruit would be plentiful and good. They were at first neglected, and ill-treated, owing to the disinclination most gardeners have to the introduction of novelties, the management of which they are unacquainted with: it was therefore six or seven years before they began to bear fruit.

Since that time, as the trees have increased in size, the crop has every year become more abundant; last autumn

the produce, though they are only six in number, was sufficient to afford the family a daily supply from the beginning of November till after Christmas. The nuts are much smaller than the Spanish imported fruit, but they are beyond comparison sweeter to the taste. The crops are little subject to injury, except from very late frosts. The trees are in general covered with blossoms to a degree that retards their annual increase. They are now so low, that a part of the crop is gathered from the ground, and the remainder by a step-ladder. They require no care or attendance on the part of the gardener, except only the labour of gathering the fruit. Most people prefer the taste of the fruit to that of the imported, but there can be no doubt that when the usage of grafting Chestnuts becomes common in this country, grafts of all other sorts will in due time be procured from the continent.

The kernels of these Chestnuts, and of all others ripened in England, are more liable to shrivel and dry up than those imported, owing to a deficiency of summer heat in our climate to mature the fruit; this must be guarded against by keeping the nuts always in a cool place, rather damp than dry; the vessel best suited to preserve them is an earthenware jar with a cover; this will not only keep them cool, but it will restrain the loss of moisture without entirely preventing perspiration, and thus endangering the loss of vitality, the immediate consequence of which is the appearance of must and mouldiness.

XXIV. *On the proper Construction of* Hot-bed Frames.

By Thomas Andrew Knight, *Esq. F. R. S. &c.*

Read March 7, 1809.

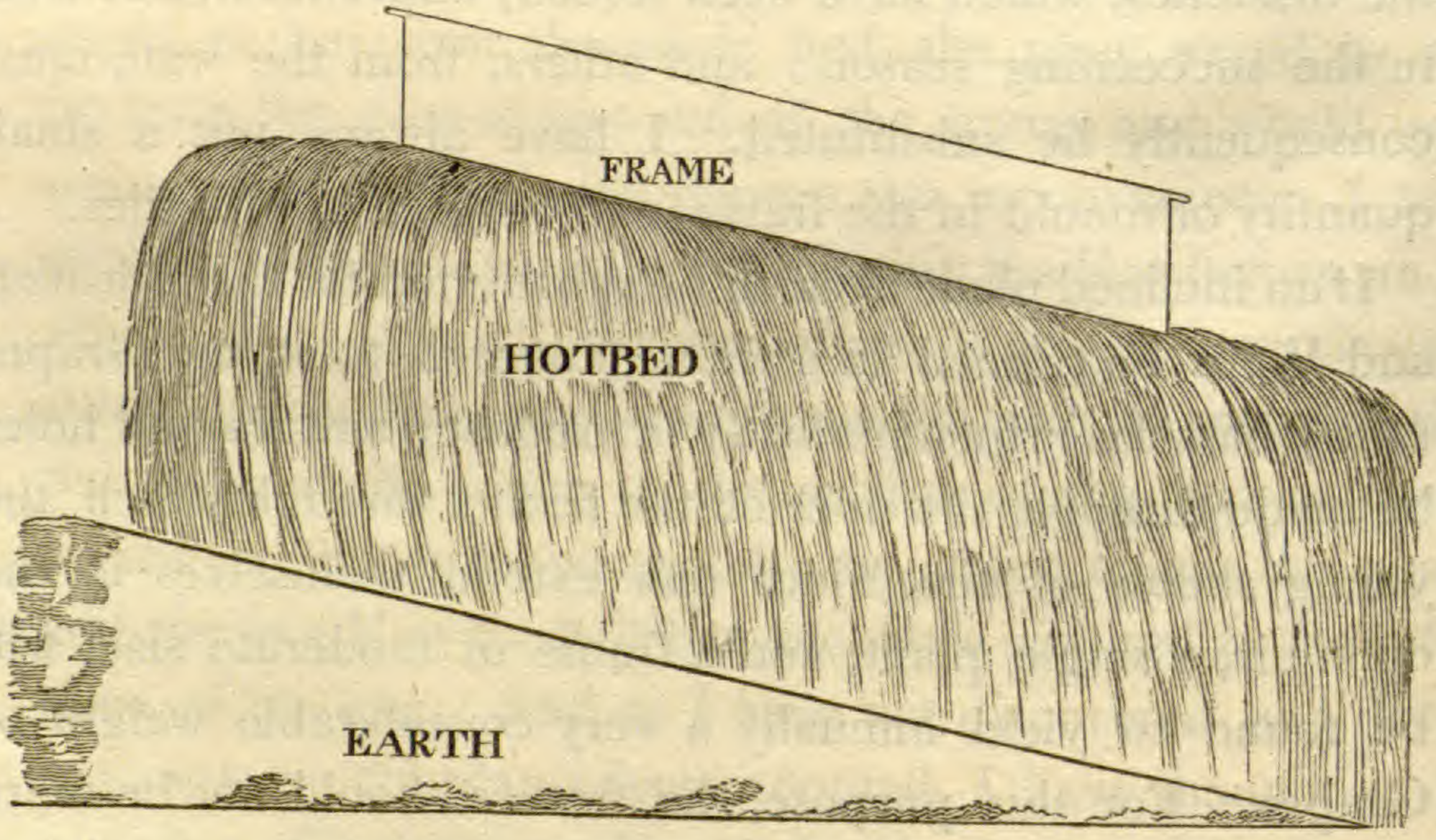
The most ignorant gardener would feel himself offended, were his skill in making a *Hot-bed*, or giving proper directions for the form of a forcing frame, called in question; and this, perhaps, is the principal reason why the structure and frames of all Hot-beds are so perfectly alike. The surface of the bed is made perfectly horizontal, and to give some degree of elevation to the glass, that end of the frame, which is to stand towards the north, is made nearly as deep again as the other; so that if the mould were placed of the same depth (as it ought to be), over the whole bed, the plant would be too far from the glass at one end of the frame, and would want space at the other. To remove this inconvenience, I tried several years ago, the effect of placing the Hot-bed on an inclined plane of earth, elevated about 15 degrees, making the surface of the dung and mould parallel with it, and adapting the form of the frame to the surface of the bed as represented in the annexed sketch; by which means the plants and the mould of the bed became more exposed to the influence of the sun. And as I have not discovered any disadvantages in the plan I have adopted, I have thought a description of it worth sending to the Horticultural Society: for though the improvement be trivial, it is not attended with

any expense whatever, since the frame, when made as recommended, costs considerably less than when it is made in the form at present used: and as labour and expense to a very great amount are annually employed in making and managing Hot-beds, any improvement in their construction becomes of some importance to the market gardener.

I have often used, with great success, a frame and Hot-bed thus formed for forcing Grapes, by placing the bed at three feet distance from the wall, to which the Vines were trained, and introducing their branches into the frame, through holes made at the north end of it (the Vines having been trained to a south wall), as soon as the first violent heat of the bed had subsided. The White Chasselas Grape, thus treated, ripens in July, if the branches of the Vine be introduced in the end of April; and a most abundant crop may be thus obtained; but the necessity of pruning very closely renders the branches, which have been forced, unproductive of fruit in the succeeding season; and others, from the wall, must consequently be substituted. I have always put a small quantity of mould in the frame, and covered it with tiles.

If an inclined plane of earth be substituted for the Hot-bed, and Vines be trained in a frame adapted to it, the Grapes (the Chasselas) ripen perfectly in August; and if small holes be made through the sides of the frame, through which the young shoots of the Vines can extend themselves in the open air, a single plant, and a frame of moderate size, will be found to yield annually a very considerable weight of Grapes. For this purpose, the frames should not be more than eight or ten feet long, nor more than five or six in breadth, or the young shoots will not be so advantageously

conducted out of them into the open air; and the depth of the frame, either for the hot-bed or inclined plane of earth, should not be less than eighteen inches. The holes in the side of the frame, through which the young shoots are to pass, should of course be closed during the spring, and till wanted; and if the weather be cold, it will be necessary to cover the frames at night. When the Grapes are nearly full-grown and begin to ripen, it will also be highly advantageous to draw off the glasses during the day in fine weather, by which means the fruit will be exposed to the full influence of the sun, without the intervention of the glass, and will attain a degree of perfection that it rarely acquires in the Vinery, or Hothouse.



XXV. *A short Account of a new Apple, called the* Downton Pippin. *In a Letter to the Secretary. By* Thomas Andrew Knight, *Esq. F. R. S. &c.*

Read March 7, 1809.

Dear Sir,

I sent last autumn a couple of dozens of a new Apple, the *Downton Pippin*, for the inspection of the Horticultural Society, and I hope that it will be thought no very humble imitation of the Golden Pippin, its male parent; being formed by introducing the pollen of that variety into the blossom of an Apple, provincially known under many names, but most generally by that of the Orange Pippin, which name, however, is by no means properly appropriated to it, for the fruit is thickly streaked with red.

The trees of both varieties were trained to a south wall, and the blossoms of the Orange Pippin were, of course, properly prepared for the experiment. The Downton Pippin is in the opinion of a committee of the Herefordshire Agricultural Society, an excellent Cider Apple, and the hydrometer, as well as the palate, indicates, that its expressed juice holds in solution, a large quantity of saccharine matter.

The trees of this new variety grow very rapidly, and are so exuberantly* productive, that I am confident the fruit of

* Some grafts of the *Downton Pippin*, sent to the Botanic Garden at Brompton, in the spring of 1807, I am informed, have already produced fruit abundantly.

them may be be brought to market at any given price, with more advantage to the grower, than any other good Apple cultivated. It ripens a little earlier than the Golden Pippin, but may be preserved in considerable perfection till March, if not gathered too ripe.

The specimens sent to the Horticultural Society grew in a cold soil, and northern exposure, nor did they afford by any means a favourable sample of this Apple. I hope next autumn to lay before them several other new varieties of the Apple, obtained by similar means, and which will prove well calculated to supply the place of those which have been long cultivated, and in which the vital principle is nearly exhausted. I remain yours,

THOMAS ANDREW KNIGHT.

Downton, February 17, 1809.

XXVI. *On the* Forcing-houses *of the* Romans, *with a List of Fruits cultivated by them, now in our Gardens. By the Right Hon. Sir* Joseph Banks, *Bart. K. B. P. R. S. &c.*

Read April 4, 1809.

Mr. Knight was the first person among us members of the Horticultural Society, who observed in reading Martial, strong traces of the Romans having enjoyed the luxury of Forcing-houses. I shall cite the principal passages upon which he has founded this observation, the truth of which is not likely to be controverted, and add such remarks as present themselves upon the *Roman Hot-houses*, with a few words on the subject of our own.

Pallida ne Cilicum timeant pomaria brumam,
Mordeat et tenerum fortior aura nemus:
Hibernis objecta notis specularia puros
Admittunt soles, et sine fæce diem, &c. Martial, lib. viii. 14.

Qui Corcyræi vidit pomaria regis,
Rus, Entelle, tuæ præferat ille domûs.
Invida purpureos urat ne bruma racemos,
Et gelidum Bacchi munera frigus edat;
Condita perspicua vivit vindemia gemma,
Et tegitur felix, nec tamen uva latet.

Fœmineum lucet sic per bombycina corpus :
Calculus in nitida sic numeratur aqua.
Quid non ingenio voluit natura licere ?
Autumnum sterilis ferre jubetur hiems. MARTIAL, lib. viii. 68.

The four last lines of the first epigram are omitted, as having no reference whatever to the subject.

From these passages, and from that of PLINY, in which he tells us that TIBERIUS, who was fond of Cucumbers, had them in his garden throughout the year, by means of *(Specularia)* stoves, where they were grown in boxes, wheeled out in fine weather, and replaced in the nights, or in cold weather,* we may safely infer that Forcing-houses were not unknown to the Romans, though they do not appear to have been carried into general use.

Flues, the Romans were well acquainted with ; they did not use open fires in their apartments as we do, but in the colder countries, at least, they always had flues under the floors of their apartments. Mr. LYSONS found the flues, and the fire-place from whence they received heat, in the Roman Villa he has described in Gloucestershire ; in the Baths also, which no good house could be without, flues were used to communicate a large proportion of heat for their Sudatories, or sweating apartments.

The article with which their windows were glazed, if the term may be used, was Talk, or what we call Muscovy glass *(Lapis Specularis)*. At Rome, the apartments of the better-most classes were furnished with curtains *(Vela†)* to keep

* Pliny, lib. xix. sect. 23.

† Ulpian I. Quæsitum 12. The Romans also made transparent bee hives of the same material. Pliny, lib. xxi. sect. 47.

away the sun; and windows (*Specularia**) to resist cold; so common was the use of this material for windows, that the glazier, or person who fitted the panes, had a name, and was called *Specularius.*

On the epigrams the following remarks present themselves. The first in all probability described a *Peach-house*, the word *Pallida*, which is meant as a ridicule upon the practice, gives reason for this supposition; we all know that Peaches grown under glass, cannot be endowed either with colour or with flavour, unless they are exposed by the removal of the lights, from the time of their taking their second swell, after stoning, to the direct rays of the sun: if this is not done, the best sorts are pale green when ripe, and not better than turnips in point of flavour, but it is not likely that a Roman Hot-house should, in the infancy of the invention, be furnished with moveable lights as ours are. The Romans had Peaches in plenty, both hard and melting†. The flesh of the hard Peaches adhered to the stones as ours do, and were preferred in point of flavour to the soft ones‡.

The second epigram refers most plainly to a *Grape-house*, but it does not seem to have been calculated to force the crop at an earlier period than the natural one; it is more likely to have been contrived for the purpose of securing a late crop, which may have been managed by destroying the first set of bloom, and encouraging the Vines to produce a second. The last line of the epigram, which states the office of the house to be that of compelling the winter to produce autumnal fruits, leads much to this opinion.

* Quamvis Cœnationem, velis et Specularibus muniant. *Seneca.*

† Pliny, lib. xv. sect. 34.

‡ Pliny, lib. xv. sect. 11.

Hot-houses seem to have been little used in England, if at all, in the beginning of the last century. Lady Mary Wortley Montague, on her journey to Constantinople, in the year 1716, remarks the circumstance of Pine Apples being served up in the desert,* at the Electoral table at Hanover, as a thing she had never before seen or heard of. Had Pines been then grown in *England*, her Ladyship, who moved in the highest circles, could not have been ignorant of the fact.

The public have still much to learn on the subject of Hot-houses, of course the Horticultural Society has much to teach. They have hitherto been too frequently misapplied under the name of Forcing-houses, to the vain and ostentatious purpose of hurrying fruits to maturity, at a season of the year, when the sun has not the power of endowing them with their natural flavour; we have begun, however, to apply them to their proper use; we have Peach-houses built for the purpose of presenting that excellent fruit to the sun, when his genial influence is the most active. We have others for the purpose of ripening Grapes, in which they are secured from the chilling effects of our uncertain autumns, and we have brought them to as high a degree of perfection here, as either Spain, France, or Italy can boast of. We have Pine-houses also, in which that delicate fruit is raised in a better style than is generally practised in its native inter-tropical countries; except, perhaps, in the well-managed gardens of rich individuals, who may, if due care and attention is used by their gardeners, have Pines as good, but cannot have them better, than those we know how to grow in England.

* See Lady Mary Wortley Montague's Letters.

The next generation will no doubt erect Hot-houses of much larger dimensions than those to which we have hitherto confined ourselves, such as are capable of raising trees of considerable size ; they will also, instead of heating them with flues such as we use, and which waste in the walls that conceal them, more than half of the warmth they receive from the fires that heat them, use naked tubes of metal filled with *steam* * instead of *smoke*. Gardeners will then be enabled to admit a proper proportion of air to the trees in the season of flowering; and as we already are aware of the use of Bees in our Cherry-houses to distribute the pollen where wind cannot be admitted to disperse it, and of shaking the trees when in full bloom, to put the pollen in motion, they will find no difficulty in setting the shyest kinds of fruits.

It does not require the gift of prophecy to foretel, that ere long the Akee and the Avocado pear of the West Indies, the Flat Peach, the Mandarine-Orange, and the Li-tchi of China, the Mango,† the Mangosteen, and the Durion of the East Indies, and possibly other valuable fruits, will be frequent at the tables of opulent persons; and some of them perhaps in less than half a century, be offered for sale on every market day at Covent Garden.

Subjoined is a list of those fruits cultivated at Rome, in the time of Pliny, that are now grown in our English gardens.

* A neat and ingenious fancy for heating Melon frames by steam, appeared in the *Gentleman's Magazine* for January 1755.

† The Mango was ripened in the Royal Gardens at Kew in the Autumn of 1808, by Mr. AITON, his Majesty's gardener, who has frequently ripened fruits of the Mespilus Japonica, which is a good but not a superior fruit

Almonds. Both Sweet and Bitter, were abundant.

Apples. Twenty-two sorts at least: sweet apples (*melimala*) for eating, and others for cookery. They had one sort without kernels.

Apricots. PLINY says of the apricot (*Armeniaca*) quæ sola et odore commendantur, *lib.* xv. *sect.* 11. He arranges them among his plums. MARTIAL valued them little, as appears by his epigram, xiii. 46.

Cherries. Were introduced into Rome in the year of the city 680, 73 A. C. and were carried thence to Britain 120 years after, A. D. 48. The Romans had eight kinds, a red one, a black one, a kind so tender as scarce to bear any carriage, a hard fleshed one (*Duracina*) like our Bigarreau, a small one with a bitterish flavor (*Laurea*) like our little wild black, also a dwarf one not exceeding three feet high.

Chestnuts. They had six sorts, some more easily separated from the skin than others, and one with a red skin; they roasted them as we do.

Figs. They had many sorts, black and white, large and small, one as large as a pear, another no larger than an olive.

Medlars. They had two kinds, the one larger, and the other smaller.

Mulberries. They had two kinds of the black sort, a larger and a smaller. PLINY speaks also of a Mulberry growing on a brier: *Nascuntur et in Rubis, l.* xv. *sect.* 27, but whether this means the Raspberry, or the common Blackberry does not appear.

Nuts. They had Hazle-nuts and Filberds; (has quoque mollis protegit barba) *l.* 15. *sect.* 24; they roasted these nuts.

Pears. Of these they had many sorts, both summer and winter fruit, melting and hard, they had more than thirty-six kinds, some were called *Libralia.* We have our Pound Pear.

Plums. They had a multiplicity of sorts *(ingens turba Prunorum)*, black, white, and variegated, one sort was called *Asinina*, from its cheapness; another *Damascena*, this had much stone and little flesh; from *Martial's Epigram*, xiii. 29, we may conclude that it was what we now call *Prunes.*

Quinces. They had three sorts, one was called *Chrysomela*, from its yellow flesh; they boiled them with honey, as we make marmalade. See *Martial*, xiii. 24.

Services. They had, the Apple-shaped, the Pear-shaped, and a small kind, probably the same as we gather wild, possibly the *Azarole.*

Strawberries. They had, but do not appear to have prized them. The climate of Italy is too warm to produce this fruit in perfection, unless in the hills.

Vines. They had a multiplicity of these, both thick skinned (*Duracina*) and thin skinned: one Vine growing at Rome produced twelve amphoræ of juice, eighty-four gallons. They had round berried, and long berried sorts, one so long that it was called *Dactylides*, the grapes being like the

fingers on the hand. MARTIAL speaks favourably of the hard skinned grape for eating, xiii. 22.

Walnuts. They had soft shelled, and hard shelled, as we have: in the golden age, when men lived upon acorns, the gods lived upon walnuts, hence the name *Juglans*, *Jovis Glans*.

As a matter of curiosity, it has also been deemed expedient to add a list of the fruits cultivated in our English gardens, in the year 1573: it is taken from a book entitled *Five Hundred Points of Good Husbandry*, &c. by THOMAS TUSSER.

THOMAS TUSSER, who had received a liberal education at Eton school, and at Trinity Hall, Cambridge, lived many years as a farmer in Suffolk and Norfolk: he afterwards removed to London, where he published the first edition of his work, under the title of 100 *Points of Good Husbandry*, in 1557.

In his fourth edition, from whence this list is taken, he first introduced the subject of gardening, and has given us not only a list of the fruits, but also of all the plants then cultivated in our gardens, either for pleasure or profit, under the following heads.

" Seedes and Herbes for the Kychen; Herbes and Rootes for Sallets and Sawce; Herbes and Rootes to boyle or to butter; Strewing Herbs of all sorts; Herbes, Branches and Flowers for windowes and pots; Herbs to still in summer; Necessarie herbes to grow in the gardens for Physick not reherst before."

This list consists of more than 150 species, besides the following fruits.

Fruits.

Apple trees of all sorts.
Apricockes
Barberries
Boollesse black and white
Cherries red and black
Chestnuts
* Cornet Plums
Damisens white and black
Filberds red and white
Gooseberries
Grapes white and red
Grene or Grass plums
† Hurtil-berries
Medlers or Merles
Mulberry
‡ Peaches white and red
Peeres of all sorts
Peer Plums black and yellow
Quince Trees
Raspis
§ Reisons
Small Nuts
Strawberries red and white
Service Trees
Wardens white and red
Wallnuts
Wheat Plums

* Probably the fruit of Cornus Mascula, commonly called *Cornelian Cherry.*

† *Hurtleberries*, the fruit of *Vaccinium vitis Idea*, though no longer cultivated in our gardens, are still esteemed and served up at the tables of the opulent people in the counties that produce them naturally; they are every year brought to London from the rocky country, near Leith Tower in Surrey, where they meet with so ready a sale among the middle classes of the people that the richer classes scarcely know that they are to be bought.

‡ The yellow fleshed Peach, now uncommon in our gardens, but which was frequent 40 years ago, under the name of the Orange Peach, was called by our ancestors *Melicoton.*

§ By *Reisons* it is probable that Currants are meant; the imported fruit of that name of which we make puddings and pies, was called by our ancestors *Raisin de Corance.*

Though the *Fig* is omitted by TUSSER, it was certainly introduced into our gardens before he wrote. Cardinal POLE is said to have imported from Italy that tree, which is still growing in the garden of the Archbishop's palace, at Lambeth.

XXVII. *On the Management of the* Onion. *By* Thomas Andrew Knight, *Esq. F. R. S. &c.*

Read April 4, 1809.

The first object of the Horticultural Society being to point out improvements in the culture of those plants which are extensively useful to the public, I send a few remarks on the management of one of these, the *Onion;* which both constitutes one of the humble luxuries of the poor, and finds its way, in various forms, to the tables of the affluent and luxurious.

Every bulbous rooted plant, and indeed every plant which produces leaves, and lives longer than one year, generates, in one season, the sap, or vegetable blood, which composes the leaves and roots of the succeeding spring; and when the sap has accumulated during one or more seasons, it is ultimately expended in the production of blossoms and seeds. This reserved sap is deposited in, and composes in a great measure, the bulb; and the quantity accumulated, as well as the period required for its accumulation, varies greatly in the same species of plant, under more or less favourable circumstances. Thus the Onion, in the south of Europe, acquires a much larger size during the long and warm summers of Spain and Portugal, in a single season, than the colder climate of England; but under the following mode of culture, which I have long practised, two summers in England

produce nearly the effect of one in Spain or Portugal, and the Onion assumes nearly the form and size of those thence imported.

Seeds of the Spanish or Portugal Onion are sown at the usual period in the spring, very thickly, and in poor soil; generally under the shade of a fruit tree; and in such situations the bulbs, in the autumn, are rarely found much to exceed the size of a large pea. These are then taken from the ground, and preserved till the succeeding spring, when they are planted at equal distances from each other, and they afford plants which differ from those raised immediately from seed, only in possessing much greater strength and vigour, owing to the quantity of previously generated sap being much greater in the bulb, than in the seed. The bulbs, thus raised, often exceed considerably five inches in diameter, and being more mature, they are with more certainty preserved, in a state of perfect soundness, through the winter than those raised from seed in a single season. The same effects are, in some measure, produced by sowing the seeds in August, as is often done; but the crops often perish during the winter, and the ground becomes compressed and saddened (to use an antiquated term) by the winter rains; and I have in consequence always found that any given weight of this plant may be obtained, with less expense to the grower, by the mode of culture I recommend, than by any other which I have seen practised.

XXVII. *An improved Method of cultivating the* Alpine Strawberry. *By* THOMAS ANDREW KNIGHT, *Esq. F. R. S. &c.*

Read April 4, 1809.

THE Strawberry is a fruit which is agreeable to the palates of so many persons, and which disagrees with the constitutions of so few, that any means of improving the culture of it, and of prolonging the season of its maturity and perfection, will probably be acceptable to the Horticultural Society: I am therefore induced to send an account of an improved method of cultivating the *Alpine Strawberry*, that is I believe, little, if at all known, and which I have practised with the best possible success.

Though the flavour of the Alpine Strawberries is generally approved, they are not much thought of, whilst the larger varieties continue in perfection, and are valued only as an autumnal crop. I was therefore led to try several different methods of culture, with a view to obtain plants that would just begin to blossom at the period when the other varieties cease; conceiving that such plants, not having expended either themselves or the virtue of the soil, in a previous crop of fruit, would afford the best and most abundant autumnal produce. Under this impression I sowed the seeds of the best Alpine variety, that I had ever been able to obtain, in pots of mould, in the beginning of August, the seeds of the preceding year having been preserved to that period; and

the plants these afforded were placed, in the end of March, in beds to produce fruit. This experiment succeeded tolerably well, but I was not quite satisfied with it; for though my plants produced an abundant autumnal crop of fruit, they began to blossom somewhat earlier than I wished, and before they were perfectly well rooted in the soil. I therefore tried the experiment of sowing some seeds of the same variety early in the spring, in pots which I placed in a hot-bed of moderate strength in the beginning of April, and the plants thus raised were removed to the beds in which they were to remain in the open ground, as soon as they had acquired a sufficient size. They began to blossom soon after, Midsummer, and to ripen their fruit towards the end of July, affording a most abundant autumnal crop of very fine fruit; and even so late as the second week in December, I have rarely seen a more abundant profusion of blossoms and immature fruit than the beds presented. The powers of life in plants thus raised, being young and energetic, operate much more powerfully than in the runners of older plants, or even in plants raised from seeds in the preceding year; and therefore I think the Alpine Strawberry ought always to be treated as an annual.

XXIX. *Observations on the Form of* Hot-houses. *By the Rev.* Thomas Wilkinson.

Read May 2, 1809.

Although it is probable, that more depends on management, than on the inclination of the roof, in any *Forcing-house* whatever, yet as it is satisfactory to proceed on something like principles, I endeavoured to ascertain why an angle of 34° was preferable to any other; which has led me to take a general view of the subject. By pointing out the times, when the sun's rays will be perpendicular to any construction, and the reflexion at the different angles of incidence, we shall be enabled to compare, with some accuracy, the effects of the sun on different degrees of inclination, abstractedly of internal arrangement, stoves, flues, and culture. Now the angle contained between the back wall of the Forcing-house, and the inclined plane of the glass roof, always equals the sun's altitude, when his rays fall perpendicularly on that plane, provided that the inclination of the plane to the horizon, be at an angle not less than 28° 2′, nor greater than 75°. The former is the case with most Cucumber-frames, the latter with many Pineries. It also

follows, that within the above limits, the sun's rays are perpendicular twice in the year, once in going to, and once in returning from, the tropic. Hence then, having determined in what season we wish to have the most powerful effects from the sun, we may construct our houses accordingly by the following rule. Make the angle contained between the back wall of the house and its roof, = to the complement of latitude of the place, ± the sun's declination for that day on which we wish his rays to fall perpendicularly. From the vernal to the autumnal equinox, the declination is to be added, and the contrary.

To apply these principles to the construction recommended by Mr. KNIGHT, we have the inclination of roof, = 34°. Therefore the sun's altitude, when his rays fall perpendicularly, is 56°, which, taking the latitude of London to be 51° 29′, will happen when his declination is 17° 31′, about May 20, and July 21. Now we want the genial warmth of the sun most in spring, and therefore, for general purposes, that construction would perhaps be the best which gives us the greatest quantity of perpendicular rays then. If the inclination were 45°, the sun's rays would be perpendicular about April 6th, and September 4th. This construction has the following limit: the height of the back wall must not exceed the width of the house, + the height of the front wall. And as the rays would vary very little from the perpendicular for several days before and after the 6th of April and Sepetmber 4th, the loss of rays arising from reflexion, would, as appears from the annexed table, be nearly a minimum. Even at the winter solstice, the loss by the obliquity of the angle of incidence would be only two in 1000 more

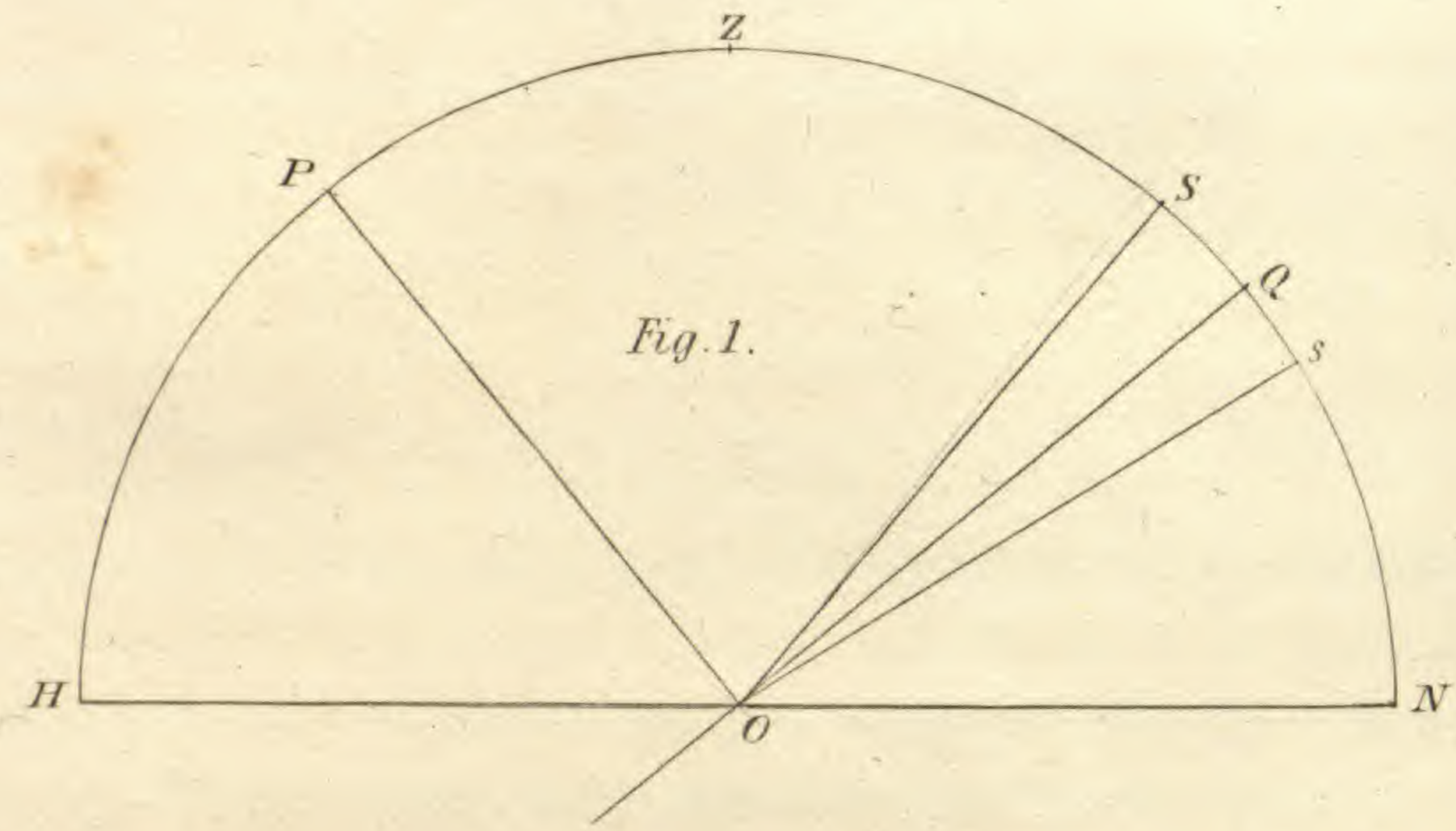


Fig. 1.

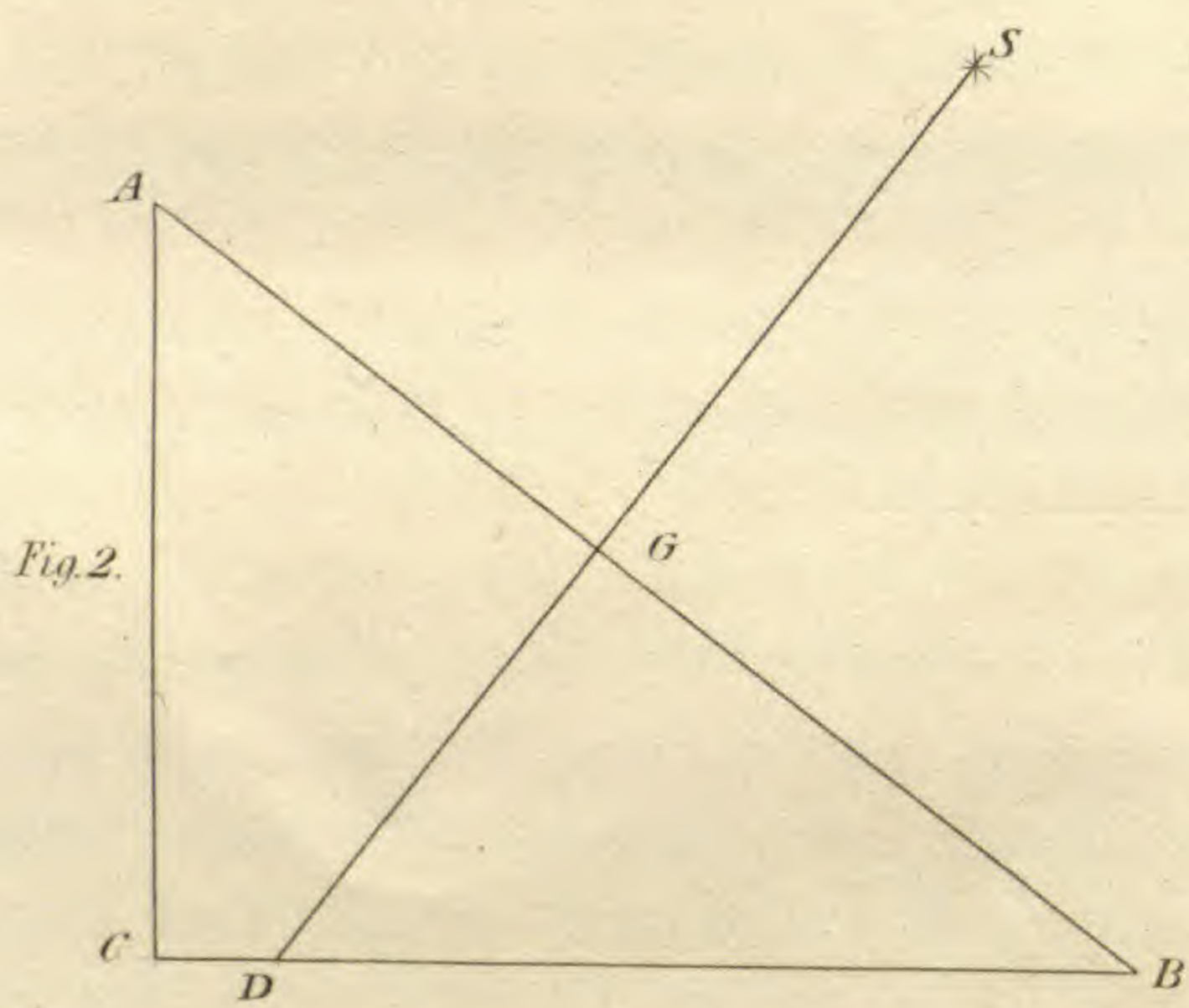


Fig. 2.

Mr. Wilkinson's Diagrams.

than when the rays fall perpendicularly. But at the angle of 34°, the two days when the rays are perpendicular being near each other, a great part of these advantages is lost, and on the contrary, the reflected rays are nearly the most possible, which they would actually be if the angle were depressed only 6° more. Besides, the good effects of the inclination are the greatest when least requisite, July 21. The diagrams will shew the angles of altitude and elevation of the roof.

In Fig. 1, HN is the horizon, OQ the equator, P the pole, Z the zenith, S and s the sun, O the earth, then the sun's altitude SON = QON ± SOQ = compt. of latitude ± sun's declination. In Fig. 2, ABC is the section of a Forcing-house, SGD a perpendicular ray, then as the triangles BGD, ACB are similar to the angle, GDB = angle CAB, i. e. the angle at A between the wall and roof = angle of sun's altitude when his rays fall perpendicularly.

Bouguer's Table of Rays reflected from Glass.

Of 1000 incidental rays when the angle of incidence is

87° 30′	584 are reflected.
85	543
82 30	474
80	412
77 30	356
75	299
70	222
65	157

Bouguer's Table of Rays reflected from Glass.

Of 1000 incidental rays when the angle of incidence is

60°	112 are reflected.
50	57
40	34
30	27
20	25
10	25
1	25

XXX. *On some new Varieties of the* Peach. *By* Thomas Andrew Knight, *Esq. F. R. S. &c.*

Read May 2, 1809.

In a former Part of the *Transactions of the Horticultural Society*,* I have mentioned some experiments I had made with the hope of obtaining new and early varieties of the *Peach*, which might prove better calculated for our climate, than those which have been imported from the southern parts of Europe: and as the character of some of the plants that I have raised affords a fair prospect of success, I have thought the following account sufficiently interesting, to induce me to send it to the Horticultural Society.

In efforts to obtain new varieties of fruits of other genera, I have had reason to conclude, from the success of former experiments, that the trees, from blossoms and seeds of which it is proposed to propagate, should have grown at least two years in mould of the best quality; that during that period, they ought not to be suffered to exhaust themselves, by bearing any considerable crop of fruit; and that the wood of the preceding year should be thoroughly ripened (by artificial heat when necessary), at an early period in the autumn: and if early maturity in the fruit of the new seedling plant is required, I think, that the fruit, within

* Horticultural Transactions, page 30.

which the seed grows, should be made to acquire maturity within as short a period as is consistent with its attaining its full size, and perfect flavour: those qualities ought also to be sought in the parent fruits, which are desired in the offspring; and the most perfect and vigorous offspring will be obtained, of plants as of animals, when the male and female parent are not closely related to each other.

The varieties of the Peach, from which I first propagated were the large French Mignonne, and the little Red Nutmeg, using the stigmata of the former, and the pollen only of the latter. The trees of each variety had been removed early in the spring of the preceding year (1801) from pots of moderate size into others which were very large, and were filled with mould of the most favourable quality that I could compose; and in these pots the plants had grown with excessive vigour. The aid of artificial heat was employed in the spring of 1802, to enable the wood and blossoms of each plant to acquire the most perfect state of maturity in the succeeding autumn; and during winter the pots were defended from severe frost, that the minute fibrous roots of the plants might be wholly preserved; and as the spring approached, the trees were kept in as low and equal a temperature as possible, that the powers of life, in the plants, might not be prematurely excited into action, nor in any degree uselessly expended. Nevertheless, owing to the wood and buds having acquired maturity early in the preceding autumn, and an accumlated excitability from long rest and cold, the blossoms began to swell rapidly on the first approach of spring; and very early in March it became necessary to place the trees in the forcing-house, the

blossoms being so far advanced, as to be subject to some danger from frost.

As soon as the blossoms had fallen, the fruit was ripened under every advantage of heat and light, that I could command, the glass having been taken off every favourable hour, during the last swelling of the fruit, to admit the solar rays, without its intervention. Three French Mignonne Peaches, only, were suffered to remain on each tree, and six of these (which attained the greatest state of perfection), afforded me eight plants in the succeeding spring. The plants were two years old when mentioned in my former communication, and I then inferred, from the rapid change observable in the character of their leaves and general growth, that they would bear fruit, as they subsequently did, when three years old.

Of the new varieties thus obtained three are very early; but I have not had an opportunity of comparing their time of ripening with that of the earliest old varieties. For the Red Nutmeg Peach did not succeed at all in my garden, and the blossoms of the Early Anne were wholly destroyed by the unfavourable weather of the spring of 1807 and the following year. Two of the new varieties, however, ripened ten days before the Royal George Peach, and three weeks before the Red Roman Nectarine, which grew on the same wall, and adjoining the seedling trees; and therefore I conceive these not to be much later varieties than their male parent, which they strongly resemble in colour, and in the form and character of their leaves: but their fruit is much larger, many having exceeded seven inches and a half in circumference. The fruit of each of the new varieties is soft and melting, and

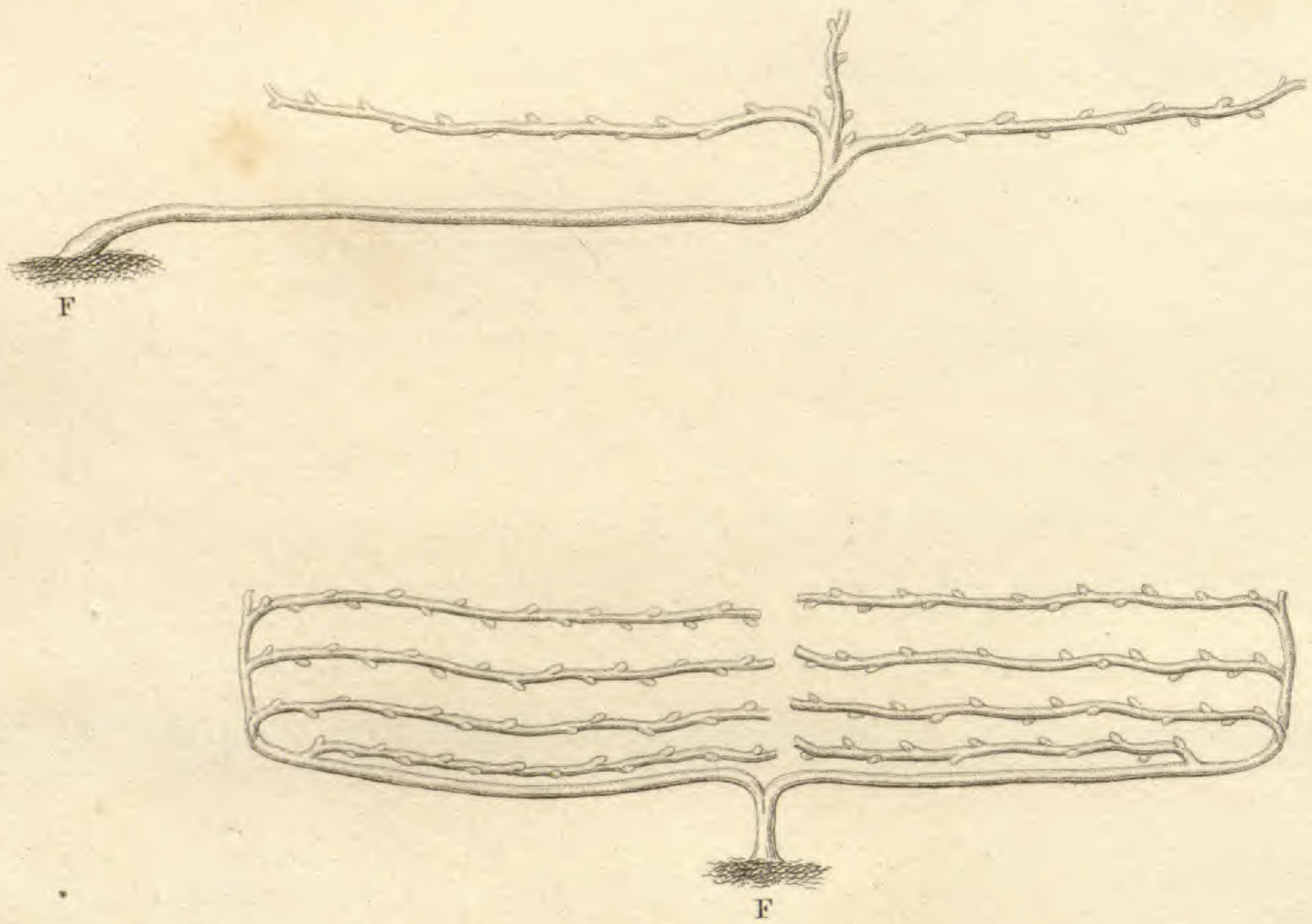
very readily quits the stone; and I thought the flavour of one of them quite equal to that of any Peach which my garden produced. In their leaves and fruit, each tree forms a perfectly distinct variety, and even where the same stone contained two plants, they bear very little resemblance to each other.

In the present spring, I exposed all the seedling plants without any covering, to ascertain the comparative degrees of hardiness of their blossoms; and in this respect I found them to differ very widely. The blossoms of two of the varieties appear, however, to be very hardy, and promise an abundant crop of fruit, though the season has been more than usually unfavourable; and I have had the pleasure to observe, that the best Peach is one of the most hardy.

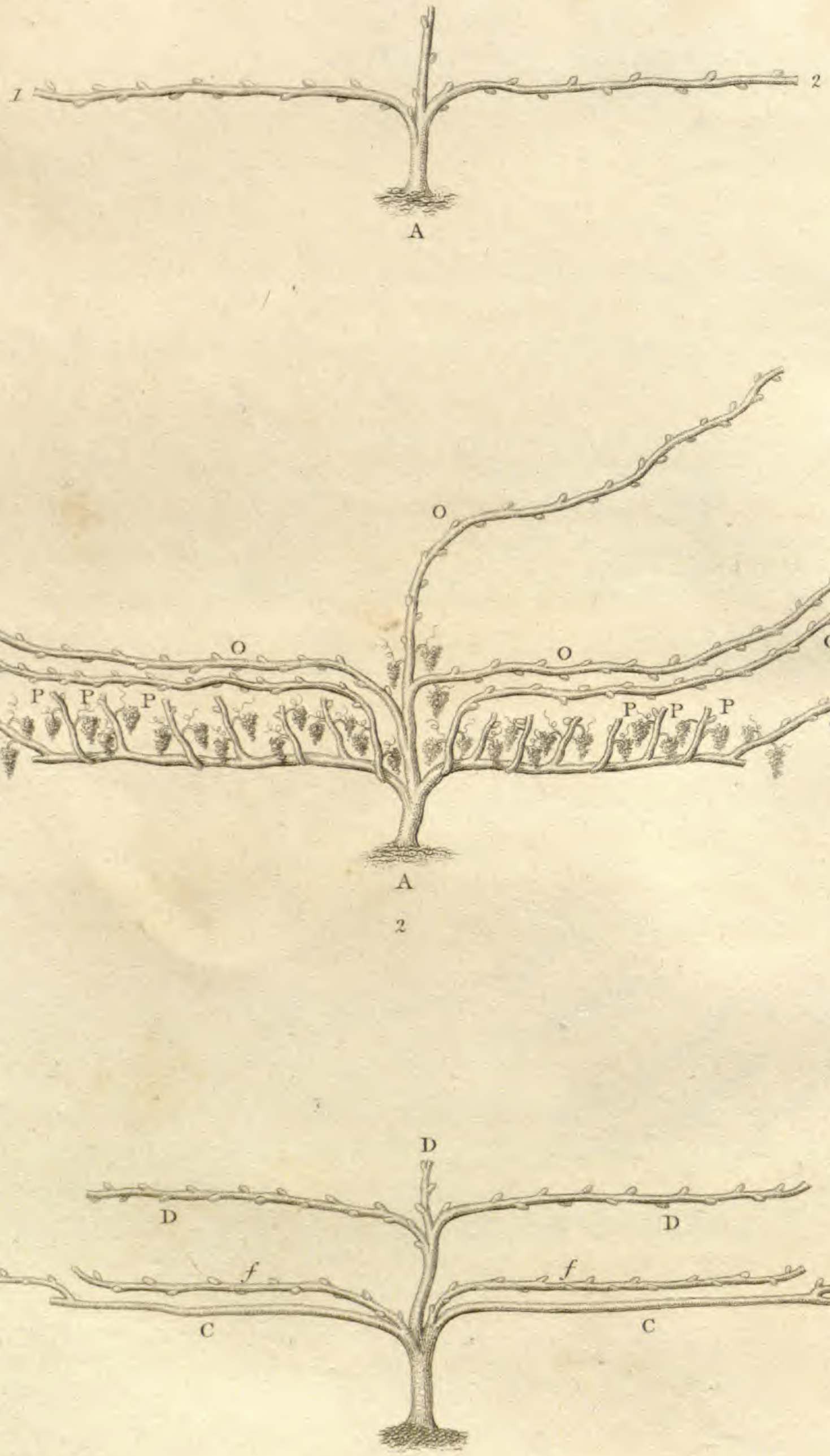
The success therefore of the first, and of the only experiment of which I have fully seen the result, on this species of fruit, has fully answered, and indeed exceeded my hopes, and I entertain little doubt that the Peach tree might, in successive generations, be so far hardened and naturalized to the climate of England and Ireland, as to succeed well as a standard in favourable situations. It is my wish to try the effects of propagating successive generations alternately from the open wall, and from the hot-house, and of introducing the pollen from the open wall to the blossoms of the hot-house, with the hope of obtaining varieties which will be at once hardy and early. The Peach does not, like many other species of fruit, much exercise the patience of the gardener, who raises it from the seed; for it may always be made to bear when three years old, and there is something in its habits which induces me to believe that it might be made to bear

at two years old. I will not venture to decide whether it might not possibly produce fruit even at the end of a single year; and therefore as the improvement of this, and other species of fruit, and adapting varieties of them to our climate, presents an ample and interesting field for experiment, I trust that I shall not labour in it alone.

In prosecuting such experiments, I would recommend the seedling Peach trees to be retained in pots, and buds from them only, to be inserted in older trees; for their rapid and luxuriant growth is extremely troublesome on the wall, and pruning is death to them.



Mr. Hayward's method of Training Vines. Plate 2.



Mr. Hayward's method of Training Vines. Plate 1.

XXXI. *On a Mode of* training Vines, *in a Letter* to Thomas Andrew Knight, *Esq. F. R. S. &c. By Mr.* Joseph Hayward.

Read November 7, 1809.

Sir,

The pleasure I have received from some of your ideas relative to the cultivation and improvement of various fruits, as expressed in different publications, (more especially in *The Transactions of the Horticultural Society*,) has emboldened me thus to address you, and to offer the following remarks on *training Vines*, through you, to the Horticultural Society.

I must first state that I have no pretensions to literature, my occupation and habits, as a woollen manufacturer, affording little leisure for extensive study or reading; and that Hitt on *Fruit Trees*, first suggested to me the following mode of training Vines, the value of which you will readily appreciate.

Previous to training any tree, for the purpose of obtaining the greatest quantity of fruit, its mode of bearing should be considered, and the object of the cultivator must of course be, to obtain the greatest quantity of bearing wood, equally and properly distributed. The Vine is a creeping plant, throwing out the most luxuriant shoots at the extremity of its branches, whether these are laid horizontal or perpendicular. In training this fruit tree, it is necessary to keep three main objects in view: *First*, to cover the space allotted to it with fruit branches, leaving room for both ripening the fruit,

and the branches that are to bear fruit the succeeding year: *Secondly*, to take off the top of each branch bearing fruit, the third joint above the uppermost bunch, except such branches as are destined to bear fruit the next year, which latter must be duly exposed, and by no means topped; for if the sap is checked in these, many of their buds will burst the same season, and the fruit for next year be destroyed: *Thirdly*, to take off all collaterals as they arise, and any shoots, which though laid in for fruit, turn out unproductive, that the whole strength of the tree may be properly applied. The better to explain the manner in which this is to be effected, I must refer you to the annexed drawings, for the present saying nothing as to soil, and other matters.

Let a stock be properly planted, so as to produce three shoots of sufficient strength and age for bearing, and this will be considerably forwarded by rubbing off all but three buds early in the spring, and keeping down all collaterals, &c. during the summer; fastening the branches occasionally, so that they may not be topped. In October or November, these branches should be cut and nailed, as in Plate VIII. Fig. A, the branches 1 and 2 to be left from three to twelve feet according to the strength of the plant, the middle branch to be shortened to three strong buds only. The following year each bud may be expected to throw out shoots bearing two bunches of grapes, and present the Fig. A. 2. All the branches should be fastened until about Midsummer, when those branches marked P should be topped, two joints above the uppermost bunch, and those marked O, which are seven, should be fastened as they grow, and carried on in the most exposed part; then the bearers being topped, and all

collaterals rubbed off, those branches will of course receive the full strength of the wood sap, and be in the most perfect state for fruiting next year. The winter following, let all the branches which bore the fruit be cut off close to the old wood, and those which are selected for the next year, marked O, be shortened to their proper length, and fastened down close to the old wood, to reach to the commencement of the young wood, continued from the extremity, as CD, in Fig. B, which it will then represent; the two branches, CC, which bore the fruit, will then be covered with young wood, FF, which will fill the same space with fruit the next, as those did the last, year; and the young shoots being fastened close to the old, will take very little additional room: the two branches, DD, are to be laid parallel with the first horizontals, at the distance of from twelve to eighteen inches, and kept in the same manner as those the first year. In the following summer the tree will be as in Plate IX. Fig. E; and if kept as directed for A. 2, will, with its addition, be as B; the branches OOO being laid horizontal as before. Thus it is obvious, the tree may be continued to any extent its root will supply, and every part of the wall covered with fruit the last, as it was the first, year. When the tree has gone the length allotted, it might be kept there, by cutting out the old horizontals, as MM, Fig. E. and bringing the others in its place. I am of opinion that the greater length the sap has to pass through the body of the Vine, and its branches, the more abundant, fine, and higher flavoured will the fruit be, and on this principle I have trained them, as F, and it answers my expectation; and if this principle is correct, it must answer in every situation, and contrary to the mode generally adopted

in Forcing-houses, of crowding in four or five plants ; if only one root was made to fill the house, the crops would be larger and more certain, more particularly so if the root and trunk were within the house, as the fluid would then be put in regular circulation, and afford an equal supply to every part of the tree. I cannot think the soil recommended by Mr. SPEECHLY the best ;* but on this I may be better able to speak hereafter. The mode here recommended will afford an opportunity for Mr. WILLIAMS's practice,† without injuring the next year's crop of fruit.

I am, Sir,

Your very obedient and humble servant,

JOSEPH HAYWARD.

Wilton, near Salisbury, Wiltshire,
June 1, 1809.

* See SPEECHLY on the Vine, 2nd Edition, page 33

† See Horticultural Transactions, page 107.

XXXII. *On some* Exotics *which endure the open Air in* Devonshire. *In a Letter to the Right Hon. Sir* Joseph Banks, *Bart. K. B. &c. By* Abraham Hawkins, *Esq.*

Read December 5, 1809.

Sir,

Though I have no knowledge of the Horticultural Society, but through the medium of extracts in the last Monthly Review (which first informed me of the existence of the Society), yet struck with your "*Hints respecting the proper Mode of inuring tender Plants to our climate,*" and residing in the very warmest part of England (the South Hams of Devonshire, of which I am a native), within view of an inlet of the sea, I am led to state to you some facts, which perhaps may not be wholly unworthy of notice.

In October, 1795, a *Camellia Japonica* was planted here among other shrubs in the open ground; it has stood every winter since, without the smallest shelter, thrives well, and has never had a branch or leaf injured by the weather; it is now about four feet high, the size of a gooseberry bush, but has not flowered.

Two plants of the *Fuchsia coccinea* were planted about four years ago, under a brick wall facing the south. At first the branches suffered by the frost, but they put forth new shoots in the spring, with much strength, and have flowered well every summer. During the two last years I was absent, but I understand that only the extremities of

the branches were injured, and they have always flowered in great perfection.

Some plants of the *Solanum pseudo-Capsicum*, or *Amomum Plinii*, are also under a brick wall (but not nailed against it), which have stood many years, and only a small part of the very extremities of their branches has been injured by frost.

Myrtles of every kind (even the *double blossomed* and the *orange*) do exceedingly well in the open ground, though the *Silver*, from the richness of the soil, soon becomes plain.

The *Buddlea globosa* likewise stands the climate, and some of the plants are ten feet high, spread wide, and make a handsome appearance. One of them is placed in a situation, open to the north-east winds, where the sun cannot shine during the short days, yet it has stood there since 1794, and never had more than the extremities of the branches hurt.

About two miles from my house is the small sea-port town of Salcombe, just between those two well-known points, the Prawl and the Bolt-head, the latter of which is in the Parish from whence this letter is written, a place that the sea washes on three sides. Perhaps of all spots in the British isles, Salcombe is the very first for climate and shelter. The celebrated Doctor Huxham used to call it the Montpellier of England. In 1774, a large *American Aloe*, only twenty eight years old, and which had always stood in the open ground, without covering, flowered there; it grew to the height of twenty-eight feet, the leaves were six inches thick, and nine feet in length, and the flowers, on forty-two branches, innumerable.

Several plants of the *Verbena triphylla* are growing at Salcombe in the open ground, and are now six feet high. I have not tried any of them myself, but as I expect to be more at home in future, than for some years past, I shall not fail to add this plant to those tender shrubs already growing around me.

Oranges and *Lemons*, trained as Peach Trees against walls, and sheltered only with mats of straw during the winter, have been seen in a few gardens of the south of Devonshire for these hundred years. The fruit is as large and fine as any from Portugal; some Lemons from a garden near this place, were, about thirty-five or forty years ago, presented to the King by the late Earl POULETT, from his sister Lady BRIDGET BASTARD, of Gerston; and there are trees still in the neighbourhood, the planting of which I believe is beyond memory. The late Mr. POLLEXFEN BASTARD, who had the greatest number of Oranges and Lemons of any one in this country, remarked above thirty years since (what tends to confirm your experiments), that he found stocks raised from seed and grafted in his own garden, bore the cold better than Oranges and Lemons imported.

I have the honour to be,

Sir,

Your very obedient servant,

ARRAHAM HAWKINS.

Alston, near Kingsbridge, Devon,
December 11, 1809.

XXXIII. *On a new Variety of* Pear. *By* Thomas Andrew Knight, *Esq. F. R. S. &c.*

Read January 2, 1810.

Had the Pear been recently introduced into England from a climate similar to that of the South of France, in which it had been found to ripen in the months of August and September, and to become fit for the desert in the four succeeding months, it might have been inferred, with little apparent danger of error, that the same fruit would ripen here in October, and be fit for our tables during winter; provided its blossoms proved sufficiently hardy to set in our climate. But had many varieties of this fruit been proved by subsequent experience to be capable of acquiring maturity before the conclusion of our summer, and in the early part of the autumn, without the aid of a wall, scarcely any doubts could have been entertained of the facility of obtaining numerous varieties, which would ripen well on standard trees to supply our tables during winter: for it would be very extraordinary if the whole of our summer, and of our long, and generally warm autumn, would not affect that, which a part of our summer alone, had been proved to be capable of effecting; nevertheless, though varieties of the Pear abound, which bear and ripen well in the early part of the autumn, we possess scarcely any good winter Pears, which do not require an east or west wall, in the warmer parts of England,

and a south wall in the colder parts. This can arise only from the want of varieties, and I venture most confidently to predict, that (if proper experiments be made to form such varieties) winter Pears of equal merits with those which now grow on our best walls, will be obtained in the utmost abundance from standard trees; and that such Pears may be sold, with sufficient profit to the grower, on as low terms as Apples are now sold, during winter: for I have had several opportunities of observing that the fruit of seedling Pear trees generally bears a considerable resemblance to that of their parent trees, and the experiments I have made on other species of fruits, induce me to believe that a good copy of almost any variety may be obtained; and as I have more than once succeeded in combining the hardiness and vigour of the Siberian Crab, with the richness of the Golden Pippin, I do not doubt of the practicability of combining the hardiness of the Swan's Egg Pear, with all the valuable qualities of the Colmar, or Bezi de Chaumontel: and I consider the climate of England as peculiarly well calculated for the necessary experiments*.

I am disposed to annex some degree of importance to the production of abundant crops of fruit, to supply our markets, at a moderate price during the winter and spring; for it has been often observed, that great manufacturing towns have generally been more healthy in seasons, when fruits have abounded, than in others; and the same palate which is accustomed to, and pleased with sweet fruits, is rarely found to be pleased with spirits, or strong fermented liquors:

* See Horticultural Transactions, page 30.

and therefore, as feeble causes, which are constantly operating, ultimately produce very extensive effects on the habits of mankind, I am inclined to hope, and to believe, that markets abundantly supplied, at all seasons, with fruits, would have a tendency to operate favourably, both on the physical and moral health of our people.

Under these considerations, I have amused myself with attempts to form new varieties of winter Pears; and though my experiments are yet in their infancy, and I have seen the result of one only, and that under very unfavourable circumstances, I am induced to state the progress that I have made, to the Horticultural Society, in the hope that others will join me in the same pursuit.

In the spring of the year 1797, I extracted the stamina from the blossoms of a young and vigorous tree of the Autumn Bergamot Pear, which grew in a very rich soil, and I introduced, at the proper subsequent period, the pollen of the St. Germain Pear, and from this experiment I obtained several fruits with ripe seeds. I, however, succeeded in raising only two plants, one of these was feeble and dwarfish in its growth, as well as wild and thorny in its appearance, and I did not think it worth preserving. The other presented a much more favourable character, and I fancied that I could discover in it some traces of the features of its male parent. This plant afforded blossoms in the spring of 1808, but I had very unfortunately removed it from the seed-bed, when it was fourteen feet high, in the preceding winter, and as it had never been previously transplanted, it had retained but very few roots. Two of the blossoms, nevertheless, afforded fruit; which began to grow with rapidity as soon as the tree

had emitted new roots, but this was not till late in the summer, and on the 8th of October, the fruit was blown from the tree by a violent storm. The two Pears were then very nearly of the same weight and size, each being somewhat more that eight inches in circumference, and in form, almost perfectly spherical. Though bruised by their fall the Pears remained sound till the beginning of December, when they became sweet and melting, though not at all highly flavoured: their flavour was, however, better than I expected, for they were blown from the tree long before they would have ceased to grow larger, if the state of the weather would have permitted; and the autumn of 1808 was so excessively wet, that some St. Germain Pears, which grew on a south wall in the same garden, were wholly without richness or flavour.

The new Pear very much resembled the St. Germain in the form of the eye and stalk, and the almost perfectly spherical shape is that which might have been anticipated from the forms of its parents. It will probably acquire a very large size under favourable circumstances; but removing from my late residence at Elton, I have been under the necessity of again transplanting the tree, and therefore I cannot expect to see its fruit in any degree of perfection till the year 1811. I have subsequently attempted to form other new varieties, by introducing the pollen of the Beurrée, the Crassane, and St. Germain Pears, into the prepared blossoms of the Autumn Bergamot, the Swan's Egg, and Aston Town Pears; but I have nor yet seen the result of the experiments. The leaves and habits of some of the young plants afford, however, very favourable indications of the future produce.

In the preceding experiments I have always chosen to propagate from the seeds of such varieties as are sufficiently hardy to bear and ripen their fruit, even in unfavourable seasons and situations, without the protection of a wall; because, in many experiments I have made with the view of ascertaining the comparative influence of the male and female parents on their offspring, I have observed in fruits, with few exceptions, a strong prevalence of the constitution and habits of the female parent; and consistently with this position, the new Pear I have described, grew very freely in an unfavourable season, and in a climate in which the St. Germain Pear, when its blossoms do not perish in the spring, will not grow at all, without the protection, and reflected heat, of a wall. I would therefore recommend every person, who is disposed to engage in the same pursuit, to employ the pollen only of such Pears, as the St. Germain, the D'Auch, the Virgouleuse, the Bezi de Chaumontel, the Colmar, and Bergamotte de Pâques, and the seeds of the more hardy autumnal and winter kinds.

I would also recommend the trees from which the seeds are to be taken, to be trained to a west wall in the warmer parts of England, and to a south wall in the colder, so that the fruit may attain a perfect, though late, maturity. Every necessary precaution must of course be taken to prevent the introduction of the pollen of any other variety, than that from which it is wished to propagate, into the prepared blossoms.

I shall take this opportunity of pointing out to the Horticultural Society the merits of a new variety of Plum, *Coe's Golden Drop*, as a fruit for the desert during winter, with

which the public are not sufficiently well acquainted. Having suspended, by their stalks, in a dry room, some fruit of this variety which had ripened on a west wall, in October, in the year 1808, it remained perfectly sound till the middle of December, when it was thought by my guests and myself, to be not at all inferior, either in richness or flavour, to the Green Gage, or Drap d'Or Plum. I am informed by Mr. WHITLEY, of Old Brompton, from whom I received it, that it bears well on standard trees.

XXXIV. *Some Account of the* Ipomæa Tuberosa, *recommending its Cultivation. By Mr.* John Turner, *F. H. S*

Read January 2, 1810.

Among the climbing plants which may be cultivated in our stoves and green-houses, few deserve a place more than the *Ipomæa Tuberosa*, its ornamental yellow flowers being exceedingly fragrant, and the root in all probability differs very little in medicinal properties from that of its congener, the Jalap, which is at present erroneously placed under Convolvulus.

The reason for this conjecture is, that some years since, a parcel of its roots were purchased by the late Mr. Ewbank, an eminent druggist at York, for the officinal Jalap, who perceiving some of them not yet dried, planted one in his stove, which flowered and ripened seeds the following summer.

This plant, however, has been introduced into our collections at an earlier period, for it flowered in that at King's-Weston, in the year 1778, and it was cultivated at Kew, in 1780.

I. Tuberosa foliis palmatis: laciniis 7, lanceolatis, acuminatis, integerrimis, glabris: paniculis sæpius 3-floris: corolla 2 pollicari: seminibus grandibus, hirtis.

I. Tuberosa with palmated leaves: divisions 7, lanceolate,

Ipomoea Tuberosa.

acuminate, quite entire, smooth: panicles generally 2-flowered: corolla 2 inches long: seeds large, hairy.

I. Tuberosa. *Willd. Sp. Pl. v.* 1. *p.* 881. Ipomæa Tuberosa. *Jacq. Obs.* 1. *p.* 39. I. heptadactyla, &c. Brown Jam. *n.* 6. *p.* 155. Convolvulus major heptaphyllus, flore sulphureo odorato. *Sloan. Hist. Jam.* 1. *p.* 152. *f.* 96. *f.* 2.

The best method of managing it is, to give the root plenty of room, and suffer the branches to ramble at pleasure upon a trellis at the top of the stove: when there is a border taken off from the bark-bed, this is attended with no difficulty, but those who have not this convenience, may plant it in a large pot, and train the branches upon sticks, or a trellis, in a glass frame, or light green-house: for though the root will live through winter in the open ground, if covered with a little long litter in severe frost, the plant requires more heat in summer to make it flower, than our climate affords naturally.

If, upon a more accurate investigation, the root is found to have the same cathartic properties as the officinal Jalap, it may be, no doubt, cultivated for use here, by training the branches against a south wall, or building, and the efficacy of the root would also in all probability be increased rather than diminished, by its not producing flowers or seeds; but it may possibly flower here, in time, in the open ground, especially if suffered to extend itself against the south side of a house.

This species was found growing wild by Sir Hans Sloane, among the trees by the banks of the Rio Cobre, in Jamaica, and very abundantly by Professor Jacquin, on the rocky mountains above the town of Cape Français, in St. Domingo.

It was also sent from Mexico, to Messrs. JOHN FRASER and Son, by Don JOSEPH NICHOLAS DE PARALBER, and a bag of its seeds ripened at Charles Town, last autumn, have been just imported.

References to Plate X.

1, Style and stigma: 2, a pericarpium, the upper part of which fig. 3, has been cut away, with the four seeds: 4, the upper part of the same seen internally, shewing the thin septum: 5, a single seed. All the parts are drawn of their natural size.

XXXV. *On* Potatoes. *By* Thomas Andrew Knight, *Esq.* *F. R. S. &c.*

Read February 6, 1810.

In the *Horticultural Transactions*, page 58, I have described a method of cultivating early varieties of the Potatoe, by which any of those, which do not usually blossom, may be made to produce seeds, and thus afford the means of obtaining many other early varieties. I also offered a conjecture, that varieties of moderately early habits, and luxuriant growth, might be formed, which would be found well adapted to field-culture, and be ready to be taken from the soil in the end of August, or the beginning of September; so that the farmer might be allowed ample time to prepare the same ground for a crop of wheat. I am now enabled to state, that the success of the experiment has in both cases fully answered every expectation that I had formed.

The facts that I have stated in the paper above referred to, and more fully in the *Philosophical Transactions*, are, I believe, sufficient to prove, that the same fluid, or sap, gives existence alike to the tuber, and the blossom and seeds, and that whenever a plant of the Potatoe affords either seeds or blossoms, a diminution of the crop of tubers, or an increased expenditure of the riches of the soil,

must necessarily take place. It has also been proved by others, as well as myself, that the crop of tubers is increased by destroying the fruit-stalks and immature blossoms as soon as they appear, and I therefore conceived that considerable advantages would arise, if varieties of sufficiently luxuriant growth, and large produce, for general culture, could be formed, which would never produce blossoms.

I have since had the gratification to find that such are readily obtained, by the means which I have detailed, and I am disposed to annex more importance to the improvement of our most useful plants, than any writer on agriculture has hitherto done; because whatever increased value is thus added to the produce of the soil, is obtained without any increased expense or labour, and therefore is just so much added to individual, and national wealth.

I formerly supposed that all varieties of the Potatoe, which ripened early in the autumn, would necessarily vegetate early in the ensuing spring, and could therefore be fit for use only during winter; but I have found that the habit of acquiring maturity early in the autumn, is by no means necessarily connected with the habit of vegetating early in the spring; and therefore by a proper selection of varieties, the season of planting crops, for all purposes, may be extended from the beginning of March, nearly to the middle of May, and each variety be committed to the soil exactly at the most advantageous period.

A variety, however, which does not vegetate till late in the spring, and which ripens early in the autumn, cannot, I conclude, particularly in dry soils and seasons, afford so large a produce as one which vegetates more early: I,

nevertheless, obtained so large a crop from one which vegetates remarkably late in the spring, and ripens rather early in the autumn, that I was induced to ascertain, by weighing, to what the produce would have amounted had the crop extended over an acre, and I found that it would have been 21 tons, 11 cwt. 80 lb. or 48,352 lbs.

In this calculation the external rows, which derived superior advantage from air and light, were excluded. No more manure, or culture, than is usually given, had been employed, for the crop was not planted with any intention of having it weighed: the wet summer was, however, very favourable.

I am not acquainted with the ordinary amount of the weight of a good crop of Potatoes, upon an acre of ground in a favourable soil, when well-manured and cultivated; but I am confident, that it may generally be made to exceed twenty tons, by a proper selection of varieties: and if four pounds of good Potatoes afford, as is generally supposed, at least as much nutriment as one pound of wheat, the produce of an acre of Potatoes, such as I have described, is capable of supporting as large a population, as eight acres of wheat, admitting the calculation of Mr. ARTHUR YOUNG, that the average produce of an acre of wheat is $22\frac{1}{2}$ bushels or 1440 lbs.; and as an acre of wheat will certainly support as large a number of people as five acres of permanent pasture, it follows, that an acre of Potatoes affords as much food for mankind, as forty acres of permanent pasture: an important subject for consideration, in a country where provisions are scarce and dear, and where so high bounties, on pasture, are

paid in the form of taxes on tillage, that the extent of permanent pasture is certainly and consequently increasing: and it must increase, under existing circumstances; for it pays a higher rent to the landlord, and relieves the farmer from much labour, anxiety, and vexation.

To what extent, a crop of Potatoes will generally be increased by the total prevention of all disposition to blossom, the soil and variety being, in all other respects, the same, it is difficult to conjecture; but I imagine that the expenditure of sap in the production of fruit-stalks and blossoms alone would be sufficient to occasion an addition, of at least an ounce, to the weight of the tubers of each plant; and if each square yard were to contain eight plants, as in the crop I have mentioned, the increased produce of an acre would considerably exceed a ton, and of course be sufficient, in almost all cases, to pay the rent of the ground.

I do not know how far other parts of England are well supplied with good varieties of Potatoes; but those cultivated in my neighbourhood in Herefordshire and Shropshire, are generally very bad. Many of them have been introduced from Ireland, and to that climate they are probably well adapted; for the Irish planter is secure from frost from the end of April nearly to the end of November: but in England, the Potatoe is never safe from frost till near the end of May; indeed I have seen the leaves and stems of a crop, in a very low situation, completely destroyed as late as the 13th of June, and they are generally injured before the middle, and sometimes in the first week of September.

The Irish varieties, being excessively late, are almost always killed by the frost whilst in full blossom; when omitting all consideration of the useless expenditure of manure, it may justly be questioned whether the tubers of such plants, being immature, can afford as nutritive, or as wholesome food, as others which have acquired a state of perfect maturity.

The preceding statement will, I trust, point out to the Horticultural Society the importance of obtaining improved varieties of the Potatoe, and I believe no plant existing to be more extensively capable of improvement, relatively to the climate of England; and if practical evidence were wanted to prove the extent, to which the culture of the Potatoe is calculated to increase and support the population of a country, Ireland most amply affords it; where population has increased amongst the Catholic poor, with almost unprecedented rapidity, within the last twenty years, under the pressure of more distress and misery, than has perhaps been felt in any other spot in Europe.

I shall conclude my present communication with some remarks upon the origin and cure of a disease, the *Curl*, which a few years ago destroyed many of our best varieties of the Potatoe; and to the attacks of which every good variety will probably be subject.

I observed that several kinds of Potatoes, dry and farinaceous in their nature, which I cultivated, produced curled leaves, whilst those of other kinds, which were soft and aqueous, were perfectly well formed; whence I was led to suspect, that the disease originated in the preternatu-

rally inspissated state of the sap in the dry and farinaceous varieties. I conceived that the sap, if not sufficiently fluid, might stagnate in, and close, the fine vessels of the leaf during its growth and extension, and thus occasion the irregular contractions which constitute this disease; and this conclusion, which I drew many years ago, is perfectly consistent with the opinions I have subsequently entertained, respecting the formation of leaves. I therefore suffered a quantity of Potatoes, the produce almost wholly of diseased plants, to remain in the heap, where they had been preserved during winter, till each tuber had emitted shoots of three or four inches long. These were then carefully detached, with their fibrous roots, from the tubers, and were committed to the soil; where having little to subsist upon, except water, I concluded the cause of the disease, if it were the too great thickness of the sap, would be effectually removed; and I had the satisfaction to observe, that not a single curled leaf was produced; though more than nine tenths of the plants, which the same identical tubers subsequently produced, were much diseased.

In the spring of 1808, Sir JOHN SINCLAIR informed me that a gardener in Scotland, Mr. CROZER, had discovered a method of preventing the curl, by taking up the tubers before they are nearly full grown, and consequently before they became farinaceous. Mr. CROZER, therefore, and myself, appear to have arrived at the same point by very different routes; for by taking his Potatoes, whilst immature, from the parent stems, he probably retained the sap nearly in the state to which my mode of culture reduced it. I

therefore conclude, that the opinions I first formed, are well founded; and that the disease may be always removed by the means I employed, and its return prevented by those adopted by Mr. CROZER.

XXXVI. *A new and expeditious Mode of* Budding. *By* Thomas Andrew Knight, *Esq. F. R. S. &c.*

Read March 6, 1810.

Parkinson, in his *Paradisus Londinensis*, which was published in 1629, has observed,* that the nurserymen of his days had been so long in the practice of substituting one variety of fruit for another, that the habit of doing so was almost become hereditary amongst them: and were we to judge from the modern practice, in some public nurseries, we might suspect the possessors of them to be the offspring of intermarriages, between the descendants of those alluded to by Parkinson. He has, however, mentioned his "*very good friend, Master* John Tradescant," and "*Master* John Miller," as exceptions: and similar exceptions are, I believe, to be found in modern days. It must always be expected that, wherever the character of the leaf does not expose the error of the grafter, as in the different varieties of the Peach and Nectarine, mistakes will sometimes occur; and therefore a mode of changing the variety, or of introducing a branch of another variety, with great expedition, may possibly be acceptable to many readers of the *Horticultural Transactions*.

The luxuriant shoots of Peach and Nectarine trees

* Paradisus Londinensis, page 571.

are generally barren; but the lateral shoots emitted, in the same season, by them, are often productive of fruit, particularly if treated in the manner recommended by me in a former communication.* In the experiments I have there described, the bearing wood was afforded by the natural buds of the luxuriant shoots; but I thought it probable that such might as readily be afforded by the inserted buds of another variety, under appropriate management. I therefore, as early in the month of June, of the year 1808, as the luxuriant shoots of my Peach trees were grown sufficiently firm to permit the operation, inserted buds of other varieties into them, employing two distinct ligatures to hold the buds in their places. One was first placed above the bud inserted; and upon the transverse section through the bark: the other, which had no further office than that of securing the bud, was applied in the usual way. As soon as the buds (which never failed under the preceding circumstances) had attached themselves, the ligatures last applied were taken off: but the others were suffered to remain. The passage of the sap upwards was in consequence much obstructed, and the inserted buds began to vegetate strongly in July: and when these had afforded shoots about four inches long, the remaining ligatures were taken off, to permit the excess of sap to pass on; and the young shoots were nailed to the wall. Being there properly exposed to light, their wood ripened well, and afforded blossoms in the succeeding spring; and these would, I do not doubt, have afforded

* See Horticultural Transactions, page 88.

fruit; but that, leaving my residence at Elton, for Downton, I removed my trees; and the whole of their blossoms, in the last spring, proved, in consequence, equally abortive.

The Spring-Grove Codlin.

W. Baker del. et sculp.

XXXVII. *A short Account of a new Apple, called the* Spring Grove Codling. *By the Right Hon. Sir* Joseph Banks, *Bart. K. B. P. R. S. &c.*

Read April 3, 1810

At the request of Mr. Knight, I beg leave to lay before the Society, the opinion formed by my friends and myself last autumn, on the merits of an Apple produced by one of his judicious mixtures, which he has done me the honour to call the *Spring Grove Codling*.

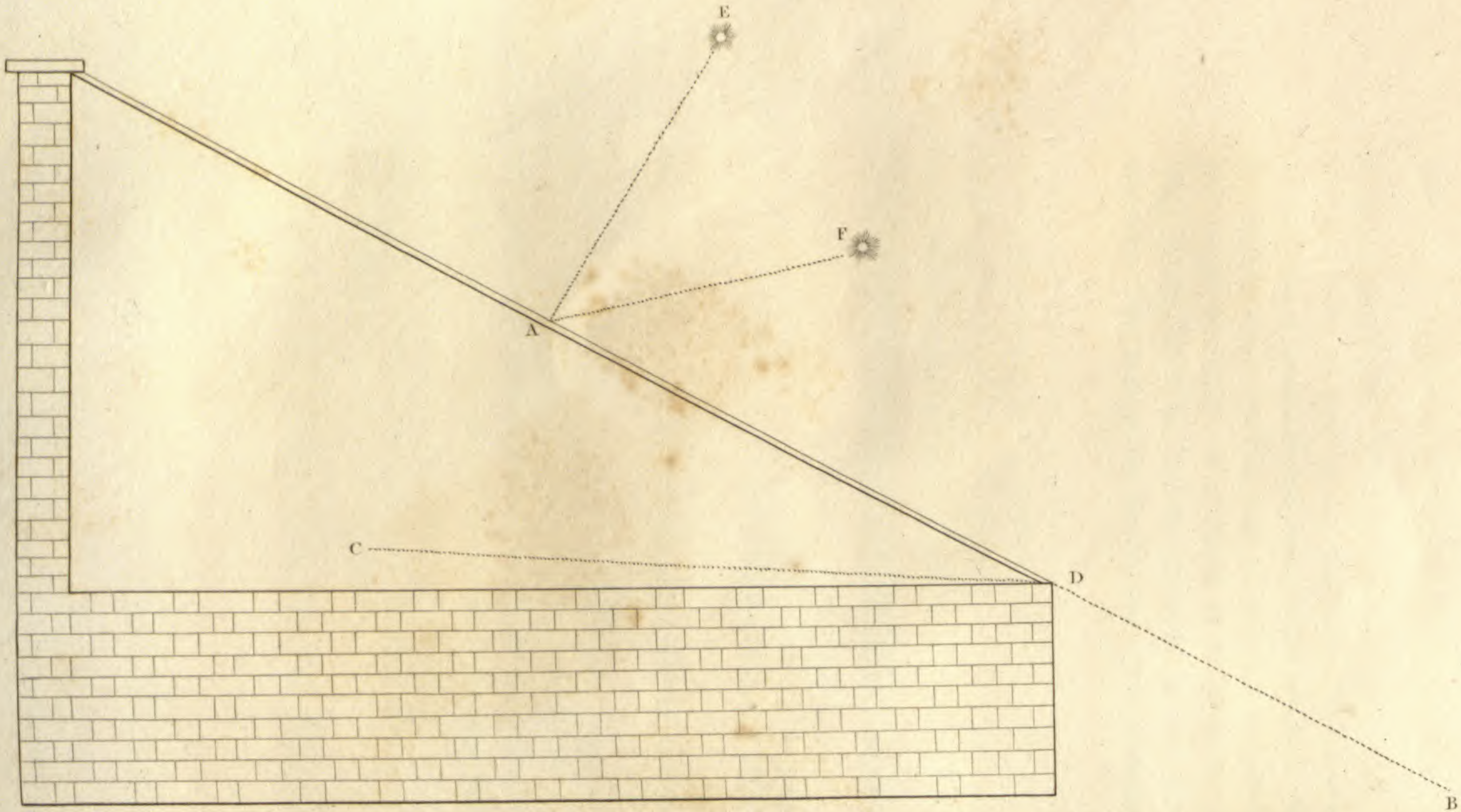
In the beginning of September, I received a small box of these Apples, which were fully ripe; when baked, they had all the quickness, and flavour, of the best winter Apples, and a considerable tinge of red.

All who tasted the pye, agreed, they had not met with any autumn Apple which, for baking, could be compared to this new one. Mr. Knight informs me, that it is ready for use in the month of July, at a season when London Geese are probably better than at any other, but when the old English accompaniment of Apple sauce was not, till Mr. Knight furnished us with this Apple, possible to be obtained; in this view it becomes an addition of importance to the old English kitchen, the cookery of which, true Englishmen still prefer to French ragouts, or to Spanish olios.

It proves of the Burr Apple kind, and may be therefore,

propagated without difficulty by cuttings, which will bear the next year, as well as by grafting. Mr. Hooker, who colours the *Pomona Herefordiensis*, has made a very excellent representation of this fruit, of which a copy accompanies this communication; as a record in the archives of the Society, it may hereafter become an useful, as well as a valuable deposit. The tree grows freely, and bears abundantly.

Mr. Knight's Peach House.



Scale of Feet.

1 2 3 4 5 6 7 8 9 10

XXXVIII. *On the best Method of constructing a* Peach-house. *By* THOMAS ANDREW KNIGHT, *Esq. F. R. S. &c.*

Read April 3, 1810.

I SENT to the Horticultural Society, in 1808, a description of my Vinery at Downton*, which I supposed to be so constructed as to receive the greatest heat, with the least expenditure of fuel, and to admit the greatest quantity of light, through the least extent of glass, at those seasons of the year when light is wanted: and I then expressed a hope, that some other Members of the Society would give plans for the proper construction of forcing-houses, for other purposes. But as this has not been done, I take up my pen to offer some observations on the most advantageous form and dimension of a *Peach-house.*

Another gentleman, the Rev. Mr. WILKINSON, has, however, subsequently undertaken to prove that the inclination of roof, which I have recommended, is, by no means, the most advantageous; and it will therefore be necessary for me first to answer the objections he has stated.† For silence, on my part, relative to those objections, would appear contemptuous, if I persist, as I do, in retaining every opinion, which I have given in that paper; particularly as the small deviation from my former plan for a Vinery, in

* See the Horticultural Transactions, page 99. † Ibid. page 161.

that I now recommend for a Peach-house, is in diametrical opposition to the theory and opinions of Mr. WILKINSON.

Mr. WILKINSON's first position is, that "*we* want the genial warmth of the sun most in the spring;" he thinks about the 6th of April.* The fires in a Vinery rarely are, and never ought to be, lighted before the middle of February; and the application of heat ought then to be slow and gradual. The leaves will consequently be young and tender in the beginning of April, and will be very ill calculated to be suddenly exposed, as they often must be, by the removal of intervening clouds, during the rapid variations of weather, and of temperature, in the end of March, and the beginning of April, to the full influence of the sun, falling vertically upon the glass. The wind is also often so cold, when the sun shines very brightly, at that season of the year, that much air cannot always be admitted without injury to those plants, with which it first comes into contact; and therefore, if very great attention be not paid by the gardener, the tender leaves and young shoots of the Vines will be often injured; and indeed, the young leaves and shoots sometimes fade much in my house, during hot days in the beginning of April, though the light does not fall vertically on the roof before the 20th of May. But waving wholly this objection, the stimulus of more light,

* Theoretical writers on vegetation are extremely apt to transfer some of the habits and feelings of animal life to plants; whence have arisen the frequent recommendations of poor soils, and cold situations, for nurseries; the writers feeling how agreeable it is to go from worse to better, and how disagreeable the contrary.

than can subsequently be given, is always exceedingly injurious, in unnecessarily expending the excitability of the plants. Every year's experience shows how much better seedling plants grow in spring, than in autumn. In the former period, the intensity of light is increasing; in the latter it is decreasing, as it would be in a house constructed according to Mr. WILKINSON's recommendation, as far as inclination of roof would operate, from the 6th of April to Midsummer.

Mr. WILKINSON's next objection is, that the inclination of roof, which I recommended, admits most light and heat when they are "*least requisite.*" Every gardener must know, that fruits are always best, when heat and light are very intense, during the period in which they are ripening, and that heat and light are then *most requisite.*

But it is not on the 21st of July only, that an inclination of roof of 34 degrees admits most light. I contend that the reflexion of light continues to diminish, as the solar rays fall more perpendicularly, and that this inclination admits more light, between the 20th of April and the 20th of August, than any other whatever. During this period the Vines blossom and ripen their fruit, in a Vinery: they also form the buds, and blossoms, for the succeeding season; and within the same period they probably generate the sap which feeds the blossoms, and leaves, and young shoots, of the following spring.* On the 4th of September, the leaves in a Vinery are nearly out of office; and a vertical sun can do little at that period, but wither the remaining crop of mature fruit.

* See Philosophical Transactions of 1805, Part I.

Mr. WILKINSON's last objections are, that my Vinery admits but very little light at the winter solstice; and that the reflected rays are then "nearly the most possible, which they actually would be if the angle were depressed only 6° more.*" I wish Mr. WILKINSON had stated the amount of the beneficial influence of the solar light and heat, upon Vines, when they have no leaves: and when the powers of life, in them, are nearly in a state of perfect repose. I have always observed, as many others have also done, that all plants, which, like the Vine, are capable of bearing a very low temperature without injury, never vegetate so strongly in the spring, as when they have been, during winter, long covered with snow: for under such circumstances, and after so long and almost total suspension of vital action, the powers of vegetable life appear to become extremely excitable; and therefore I should be happy to find Mr. WILKINSON's calculation correct. But the solar rays fall vertically on the roof of my Vinery, when the altitude of the sun is fifty-six, as he states; and the altitude of the sun, in the latitude of this place, exceeds fifteen at the winter solstice. The angle of incidence does not, therefore, appear to me to be so much as 41, nor the reflected rays (according to Bouguer's table) quite 36 out of a thousand, instead of being, as Mr. WILKINSON states, "nearly the most possible;" and I am quite at a loss to comprehend how the angle of incidence can be 87° 30, when the inclination of the roof of a Vinery is 6 degrees below 34, that is 28, and the altitude of the sun more than 15.

* See Horticultural Transactions, page 163.

I therefore venture to conclude, though I confess myself to be much less skilled in mathematics, than in horticulture, that Mr. WILKINSON's calculations are erroneous. I enter into the controversy with reluctance, and (believing that both of us have only one object in view, that of advancing the science of Horticulture) I hope it will here end. Nevertheless, if I err in any of the positions stated, I shall be happy to be better informed by Mr. WILKINSON, or any other gentleman. I now proceed to offer my opinions on the most advantageous form and dimensions of a Peach-house.

Scarcely any fruit can be raised in greater abundance, or with fewer chances of failure, than the Peach in a forcing-house; where the insects, which often prove so formidable in the open air, are easily destroyed, and where the tree is subject to scarcely any other disease than the mildew, and I have reason to believe, that the appearance of this disease may, in general, be very easily prevented by selection of proper soil, and by proper management. But though a crop of Peaches, or Nectarines, is very easily obtained under glass, experience seems to have proved that neither of these fruits acquire perfection, either in richness or flavour, unless they be exposed to the full influence of the sun, during their last swelling, without the intervention of the glass. It has consequently been the practice, in some gardens, to take off the lights wholly before the fruit begins to ripen; and in warm seasons, and favourable situations, this mode of management succeeds perfectly well. But in the colder parts of England, this cannot be done; and if the weather, in any part, prove cold and wet, just

after the lights are taken off, the growth of the fruit is suddenly checked, and its quality greatly injured: and I have never met with the Peach in so much perfection, as when it has been raised in a house where it could be conveniently exposed to the sun in warm and bright days, and secluded from the cold night air, and rain; which mode of management can, I think, be adopted most conveniently in a house constructed according to the annexed sketch and dimensions, and the following directions.

As the lights, to be moved to the required extent, with facility, must necessarily be short, the back wall of the house must scarcely extend nine feet in height; and this height raises the rafters sufficiently high to permit the tallest person to walk with perfect convenience under them. The lights are divided in the middle, at the point A, and the lower are made to slide down to the point D, and the upper to the point A*. The flue enters on the east or west end, as most convenient, and passes within six inches of the east and west wall; but not within less than two feet of the low front wall; and it returns in a parallel line through the middle of the house, in the direction either east or west, and goes out at the point at which it entered. The house takes two rows of Peach or Nectarine trees, one of which is trained on trellises, with intervals between, for the gardener to pass, parallel with the dotted line C. These trees must be planted between the flue and the front wall; and the other row near the back wall, against which they are to be trained.

* A bar of wood must extend from D to B, opposite the middle of each lower light, to support it, when drawn down

If early varieties be planted in the front, and the earliest where the flue first enters, these being trained immediately over the flue and at a small distance above it, will ripen first; and if the lower lights be drawn down in fine weather, to the point B, every part of the fruit on the trees which are trained nearly horizontally, along the dotted line C, will receive the full influence of the sun. The upper lights must be moved, as usual, by cords and pullies: and if these be let down to the point A, after the fruit on the front trees is gathered, every part of the trees on the back wall will be fully exposed to the sun, at any period of the spring and summer, after the middle of April, without the intervention of the glass. A single fire-place will be sufficient for a house of 50 feet long; and I believe the foregoing plan and dimensions will be found to combine more advantages, than can ever be obtained in a higher or wider house.*

Both the walls and flue must stand on arches, to permit the roots of the trees to extend themselves in every direction, beyond the limits of the walls; for whatever be the more remote causes of mildew, the immediate cause generally appears to be want of moisture beneath the soil, particularly if it be combined with excess of moisture, or dampness, above it. In experiments which I have made to discover the cause of mildew, in other plants, I have found that nothing so effectually prevents its appearance as abundant moisture be-

* The inclination of the roof is depressed 6 degrees below that of my Vinery; because the lights will always be drawn down at, or before Midsummer, and till near that period the solar rays will every day fall more and more perpendicularly on the roof; and the lower lights can, with this inclination, be drawn down to the point B, without coming into contact with the ground.

neath the soil; and many gardeners, who have had the misfortune to cultivate the Peach in situations where the roots, at a small depth beneath the soil, were destroyed by water during winter, or where the same effect was produced by the unfavourable nature of the subsoil, must have observed the injurious effects of mildew.

I shall conclude my paper with observing, that I have never seen the Peach in so great a state of perfection, as when cultivated very nearly according to the preceding directions: and I estimate so highly the advantages of bringing forward the fruit under glass, till it is nearly full grown, and then exposing it to the stronger stimulus of sunshine, without the intervention of the glass, and excluding it from rain and dews, that I believe the Peach might be thus ripened in greater perfection at St. Petersburg, in a house properly adapted to the latitude of that place, than in the open air at Rome, or Naples.

XXXIX. *On the Cultivation of* Horse-radish. *By Mr.* Joseph Knight, *F. H. S.*

Read June 5, 1810.

The cultivation of this wholesome and useful vegetable hitherto appears to have been much neglected. Being a plant that thrives in almost all soils and situations to greater or less perfection, it has not demanded the particular attention of gardeners, nor have I the most favourable opportunity of cultivating it, although I now venture to lay the following account before the Horticultural Society.

Horse-radish thrives best in deep, soft, sandy loam, that is not very dry in summer, nor inundated in winter: the situation must be open.

Trench the ground three feet deep, and if fresh grass-land, it should lie twelve months to pulverise, and will be improved by growing a crop of potatoes the first summer. In the following February procure your sets, in the choice of which take the strongest crowns or leading buds from old plants, cutting them about two inches long: when a sufficient quantity is thus prepared, proceed to mark out the ground in four-feet beds and one-foot alleys, by strong durable oak stakes, then take from the first bed nine inches of the top soil, laying it upon the adjoining bed; after which take out an opening at one end of the bed, in the common way of trenching, fifteen inches deep from the present surface; then level the

bottom, upon which plant a row of sets across the bed, at nine inches apart each way, with their crowns upright; afterwards dig the next trench the same width and depth, turning the earth into the first trench over the row of sets: thus proceeding, trench after trench, to the end.

Where more than the produce of one bed is required for the supply of the family for twelve months, the third bed is next to be planted, which treat as directed for the first, only observing to lay the earth on the fourth, and so on for any number of beds, being careful to leave the earth of the beds, which are planted, as light as possible, and taking great care to avoid treading them at any time until the crop is in a proper state to take up, or to plant or sow other crops upon the ground; but upon every alternate bed, which is not planted, a dwarf annual crop may be grown.

About the month of May, the plants will make their appearance, and in the course of the summer grow very strong. They must be kept clear from weeds: and as soon as the leaves decay in autumn, let them be carefully raked off with a wooden-toothed rake, which is all that is required until the following February, when eighteen inches of the earth of the unplanted bed must be laid as light as possible, and equal, over the beds that are planted; then trench and plant the vacant beds exactly in the same manner as before directed. Let the same care be observed to keep the ground clear from weeds until the following autumn, by which time the plants will have made surprising progress. As soon as the leaves decay, let them be taken off by a wooden rake, after which the first planted Horse-radish may be taken up, by opening a trench at one end of the bed to the bottom of the roots, so

that they may be taken up entire and sound: these for size and quality will be such as are not generally seen. It is also necessary to be very careful in digging up the crop, to pick every lateral root and fibre out of the ground, as the smallest roots rarely fail to grow, and would, if left in the ground, injure the succeeding crop. The following February the one year old crop will require additional earth as before directed, and must of course be taken from those beds which are now vacant, which, when done, if the ground appears poor, or unlikely to produce another vigorous crop, they must have a coat of manure. The best manure for Horse-radish is leaf-mould, or other thoroughly decayed vegetable substances; when such cannot be got, cow or horses' dung may be used, but it should be in a very rotten state: this manure should be well mixed with the earth to the depth the Horse-radish is intended to be planted; after which the ground may be planted, in due season, as before directed. When Horse-radish is grown for market, it is customary to sell it with its crowns or tops perfect, consequently, the market gardeners have not always a sufficient quantity of crowns to furnish their new plantations; therefore, to made out this deficiency, they sometimes cut the old knotty roots into sets, which rarely produces good handsome sticks. With little difficulty they might be accommodated with plenty of crowns, if they would take the trouble, which would be very little, to plant a quantity of their refuse Horse-radish in some inferior piece of ground, or unfavourable situation for more delicate plants, about six inches deep, and six inches apart from plant to plant; these, in the course of one year, would furnish any

quantity; and, by taking off the crowns, each plant would furnish from one to four or five tolerable crowns. This, if necessary, might be repeated for several successive years, and would be attended with no more trouble than keeping the ground free from weeds.

XL. *On the Culture of the* Potatoe in Hot-beds. *By* Thomas Andrew Knight, *Esq. F. R. S. &c.*

Read November 6, 1810.

The *Potatoe* being now very extensively cultivated under glass, and with artificial heat, any improvement of its culture will probably prove acceptable to many readers of the Horticultural Transactions; and I am therefore induced to send the following account of some methods which I have practised with success, and which will, I believe, be found better than any at present generally known.

The varieties of Potatoes, which are well calculated for early forcing, begin to vegetate before Christmas; and it is of consequence to preserve the germs and roots first emitted from injury, where a crop of good Potatoes is required before the end of May. I therefore plant my Potatoes in pots of about six inches diameter, in January (a single Potatoe in each), and the pots are then placed in the ground, and covered with litter, to protect them from frost; and in this situation they remain till the hot-bed is ready to receive them. In the mean time the roots extend themselves through the mould within the pots, and the germs reach its surface; whilst the excitability of the plants is not at all expended on account of the low temperature in which they vegetate: and, therefore, when plunged into the hot-bed, they instantly shoot

with excessive rapidity, and in a few days begin to generate tubers. One stem alone should be suffered to grow in each pot; for where more remain the tubers are smaller, and the crop is not increased in weight. When the plants grow in small pots, the gardener will have apparently the advantage of being able to take out the largest Potatoes by inverting the pots, without materially injuring the fibrous roots; but this practice will rarely be found eligible, because the plants, having the range of their roots confined to the limits of the pot, soon occupy the whole of their pasture, and therefore do not produce their tubers in succession as they will under common circumstances.

The lights should be drawn off during the day, when the spring is far enough advanced to permit this to be done without injury to the plants: and early in May the pots may be taken out of the hot-bed, which may be employed for other purposes; and as it must necessarily have been kept very dry during the latter period of the growth of the Potatoes, it will generally afford a strong heat on being well watered.

I confine my plants (which are naturally of very dwarfish growth) to small pots, because under this mode of culture the tubers acquire maturity sooner, and are better; but the crop is not so heavy as when their fibrous roots are permitted to extend more widely: and therefore, where a larger, but rather later crop, is required, the best plan is to put the tubers to vegetate in small pots, and from these to remove them, with their roots and germs uninjured, to the hot-bed.

I tried the effect of placing a few tubers (half a dozen only), on the floor of my cellar, disposing them just in contact with

each other; and as soon as the germs were about four inches long, a hot-bed was made ready to receive them. This experiment succeeded perfectly; and as it is not attended with so much expense and trouble as either of the preceding methods, it will be found, in many cases, the most eligible. All that appears necessary to obtain an early crop is, to advance the growth of the plant, as much as convenient, under a low temperature, so as to avoid all unnecessary expenditure of its excitability; and, subsequently, to preserve its germs and roots as much as possible uninjured in transplantation.

Were the Potatoe incapable of being raised, by forcing, in greater perfection than it is found in the markets of the metropolis, I should think the labour and expense of propagating it very ill applied: but the yellow variety, which is now very generally cultivated round London, and which is known in other parts of the kingdom under the name of Fox's Seedling, has no other merits, whilst young, than its earliness, and a moderately large produce, for in every other respect it is below mediocrity; and, even when full grown, it is never excellent: indeed a good Potatoe for forcing does not appear to me to be at present in the possession of the market gardeners of London.

I hoped to have sent this year to the Horticultural Society, samples of two or three very early new varieties of Potatoes, which I have obtained from seed by the process formerly detailed in the *Transactions*;* and for that purpose I had planted a considerable quantity. But, unfortunately, I planted them in a field at a considerable distance from my house, for the advantage of fresh soil, where the rooks, from

* See page 57.

a rookery in the neighbourhood, discovered them, and so nearly destroyed the whole, in June, that my best varieties but just escaped total destruction: next season I hope to be more fortunate.

XLI. *Remarks on the present Mode of* Budding *and* Grafting *Standard Fruit Trees. By Mr.* John Wilmot, *of Isleworth.*

Read December 4, 1810.

The old way of *grafting*, and *budding* standard Fruit Trees, was upon a stem or stock several feet in height; and it is by this mode of raising trees, that we now see so many beautiful and flourishing orchards. But this will, I very much fear, be looked for in vain by those who are to come after us, if a stop is not speedily put to the method followed at present. They are grafted and budded upon stocks but a few inches high, and this practice (although it certainly answers the purpose of promoting a quick supply of plants), if it be well considered, will be productive of the greatest mischief. The nurseryman, in working the standard fruit tree from the bottom of the stock, is not only injuring the individual who plants, but does irreparable injury to the public. Trees thus worked, I am well assured, will, in the ordinary course of things, last but a short time, and, instead of continuing for half a century in health and vigour, will begin to decline, and decay, after a lapse of a very few years. This, I conceive, must be particularly the case with trees planted in agarden, where frequent manurings are continually adding to the soil, so that in a short time it is raised above the worked part. In this case, the whole of the stock becomes buried, and is by that means deprived of the genial influence of the sun and of the atmosphere, and being thus

abridged of the nourishment which nature intended for it, begins to decline in vigour, and soon after decays and perishes. This I have frequently observed in my own experience, and hence it is that trees are continually decaying, and such frequent supplies of them are required.

It ought also to be considered, for it is, in my opinion, a matter of great importance, that by the practice I deprecate, fruit trees are exposed to much greater danger through external injuries, than they otherwise would be. It is notorious that the bearing stem (especially of Peaches, Nectarines, and Apricots) is much more tender, and therefore much more liable to be injured than the stock; and if injured, is by no means so likely to be soon and effectually healed. Every man of observation knows, that the stock will bear, without material injury, wounds and bruises, which would occasion to the other a rapid and incurable decline. As, therefore, by this new method, the whole, or almost the whole, of the stem of the tree is of this tender nature, and by the old method, the whole of the stem was of the hardiest; it is evident that trees, as they are now raised, are exposed to perpetual injuries from the spade, cattle, insects, &c., which they would not be, if the old method of working from the top were to be restored. Arguments need not, I conceive be multiplied to prove, that nature in its wild state, is much more able to bear injuries with impunity, than it is in a state of cultivation, and that the latter often becomes a prey to gum, canker, &c., which produce a gradual decline, from causes, which would do none, or a very trifling injury, to the stock.

XLII. *A concise View of the* Theory *respecting* Vegetation, *lately advanced in the Philosophical Transactions, illustrated in the Culture of the* Melon. *By* Thomas Andrew Knight, *Esq. F. R. S. &c. President.*

Read January 2, 1811.

The Council of the Horticultural Society having desired that I would send to the Society a general view of my *Theory of Vegetable Physiology*, which has been published by the Royal Society, I have great pleasure in obeying their wishes; and conceiving that I shall be able to render it more clear and useful, by making it illustrative of the proper culture of some particular plant, and by referring the reader to the papers in the *Philosophical Transactions* for evidence in support of the circumstances stated, I have for this purpose chosen the Melon.

A seed, exclusive of its seed-coats, consists of one or more cotyledons, a plumule or bud, and the caudex or stem of the future plant, which has generally, though erroneously, been called its radicle*. In these organs, but principally in the cotyledons, is deposited as much of the concrete sap of the parent plant, as is sufficient to feed its offspring, till that has attached itself to the soil, and become capable of absorbing and assimilating new matter.

The plumule differs from the buds of the parent plant in

* See Philosophical Transactions, 1809.

possessing a new and independent life, and thence in assuming, in its subsequent growth, different habits from those of the parent plant. The organizable matter which is given by the parent to the offspring in this case, probably exists in the cotyledons of the seed, in the same state as it exists in the alburnum of trees; and like that, it apparently undergoes considerable changes before it becomes the true circulating fluid of the plant: in some it becomes saccharine, in others acrid and bitter, during germination.* In this process the vital fluid is drawn from the cotyledons into the caudex of the plumule or bud, through vessels which correspond with those of the bark of the future tree, and are indeed perfect cortical vessels.† From the point of the caudex springs the first root, which, at this period, consists wholly of bark and medulla, without any alburnous or woody matter; and, if uninterrupted by any opposing body, it descends in a straight line towards the centre of the earth, in whatever position the seed has been placed, provided it has been permitted to vegetate at rest.‡

Soon after the first root has been emitted, the caudex elongates, and taking a direction diametrically opposite to that of the root, it raises, in a great many kinds of plants, the cotyledons out of the soil, which then become the seminal leaves of the young plant.‖ During this period the young plant derives nutriment almost wholly from the cotyledons or seed-leaves, and if those be destroyed, it perishes. Gravitation, by operating on bodies, differently organized, and of different modes of growth, appears at once the cause why, in the

* Philosophical Transactions, 1805. † Ibid. 1809. ‡ Ibid. 1809.
‖ Ibid. 1806.

preceding case, the root descends, and why the elongated plumule ascends.*

The bark of the root now begins to execute its office of depositing alburnous or woody matter; and as soon as this is formed, the sap, which had hitherto descended only through the cortical vessels, begins to ascend, through the alburnum. The plumule in consequence elongates, its leaves enlarge and unfold, and a set of vessels, which did not exist in the root, are now brought into action. These, which I have called the central vessels, surround the medulla, and, between it and the bark, form a circle upon which the alburnum is deposited, by the bark, in the form of wedges, or like the stones of an arch.† Through these vessels, which diverge into the leaf stalks, the sap ascends, and is dispersed through the vessels, and parenchymatous substance of the leaf; and in this organ the fluid recently absorbed from the soil, becomes converted into the true sap or blood of the plant: and as this fluid, during germination, descended from the cotyledons and seed-leaves of the plant, it now descends from its proper leaves, and adds, in its descent, to the bulk of the stem, and the growth of the roots. Alburnum is also deposited in the stem of the plant, below the proper leaves, as it was previously deposited below the seed-leaves, and from this spring other central vessels, which give existence to, and feed other leaves and buds.‡

A considerable part of the ascending fluid must necessarily have been recently absorbed from the soil: but in the alburnum it becomes mixed with the true sap of the plant, a portion of which, during its descent down the bark, appears

* Philosophical Transactions, 1806. † Ibid. 1801. ‡ Ibid. 1801 and 1805.

to secrete into the alburnum, through passages correspondent to the anastomosing vessels of the animal economy*. For as the cotyledons, or seed-leaves first afforded the organizable matter which composed the first proper leaves, so these, when full-grown, prepare the fluid which generates other young leaves, the health and growth of which are as much dependent on the older leaves, as those, when first formed, were upon the cotyledons.†

The power of each proper leaf to generate sap, in any given species and variety of plant, appears to be in the compound ratio of its width, its thickness, and the exposure of its upper surface to light, in proper temperature. As the growth of the plant proceeds, the number and width of the mature leaves increase rapidly, in proportion to the number of young leaves to be formed; and the creation consequently exceeds the expenditure of true sap. This therefore accumulates during a succession of weeks, or months, or years, according to the natural habits and duration of the plant, varying considerably according to the soil and climate in which each individual grows: and the sap thus generated is deposited in the bulb of the Tulip, in the tuber of the Potatoe, in the fibrous roots of Grasses, and in the alburnum of Trees, during winter, and is dispersed through their foliage and bark during the spring and summer.‡

As soon as the plant has attained its age of puberty, a portion of its sap is expended in the production of blossoms, and fruit. These originate from, and are fed by central vessels, apparently similar to those of the succulent annual shoot and leaf stalk, and which probably convey a similar fluid;

* Philosophical Transactions, 1807. † Ibid. 1805. ‡ Ibid. 1809.

for a bunch of grapes grew and ripened, when grafted upon a leaf stalk; and a succulent young shoot of the Vine, under the same circumstances, acquired a growth of many feet*.

The fruit, or seed-vessel, appears to be generated wholly by the prepared sap of the plant, and its chief office to be that of adapting the fluids, which ascend into it, to afford proper nutriment to the seeds it contains†.

I proceed to offer some observations upon the proper culture of the *Melon*.

There is not, I believe, any species of fruit at present cultivated in the gardens of this country, which so rarely acquires the greatest degree of perfection, which it is capable of acquiring in our climate, as the Melon. It is generally found so defective both in richness and flavour, that it ill repays the expense and trouble of its culture; and my own gardener, though not defective in skill or attention, had generally so little success, that I had given him orders not to plant Melons again. Attending, however, after my orders were given, more closely to his mode of culture, and to that of other gardeners in my neighbourhood, I thought I saw sufficient cause for the want of flavour in the fruit, in the want of efficient foliage; and appealing to experiment, I have had ample reason to think my opinions well founded.

The leaves of the Melon, as of every other plant, naturally arrange themselves so as to present, with the utmost advantage, their upper surfaces to the light: and if, by any means, the position of the plant is changed, the leaves, as long as they are young and vigorous, make efforts to regain their proper position. But the extended branches of the Melon

* Philosophical Transactions, 1803 and 1804. † Ibid. 1801.

plant, particularly under glass, are slender and feeble; its leaves are broad and heavy, and its leaf stalks long; so that if the leaves be once removed, either by the weight of water from the watering pot, the hand of the gardener in pruning or eradicating weeds, or any other cause, from their proper position, they never regain it; and in consequence, a large portion of that foliage, which preceded, or was formed at the same period with the blossoms, and which nature intended to generate sap to feed the fruit, becomes diseased and sickly, and consequently out of office, before the fruit acquires maturity.

To remedy this defect, I placed my plants at greater distances from each other than my gardener had previously done, putting a single plant under each light, the glass of which was six feet long by four wide. The beds were formed of a sufficient depth of rich mould to ensure the vigorous growth of the plant: and the mould was, as usual, covered with brick-tiles, over which the branches were conducted in every direction, so as to present the largest possible width of foliage to the light. Many small hooked pegs, such as the slender branches of the beech, the birch, and hazle, readily afford, had been previously provided; and by these, which passed into the mould of the bed, between the tiles, the branches of the plants were secured from being disturbed from their first position. The leaves were also held erect, and at an equal distance from the glass, and enabled, if slightly moved from their proper position, to regain it.

I, however, still found that the leaves sustained great injury from the weight of the water falling from the watering pot; and I therefore ordered the water to be poured, from a vessel

of a proper construction, upon the brick-tiles, between the leaves, without at all touching them; and thus managed, I had the pleasure to see, that the foliage remained erect and healthy. The fruit also grew with very extraordinary rapidity, ripened in an unusually short time, and acquired a degree of perfection, which I had never previously seen.

As soon as a sufficient quantity of fruit (between twenty and thirty pounds) on each plant is set, I would recommend the further production of foliage to be prevented, by pinching off the lateral shoots as soon as produced, wherever more foliage can not be exposed to the light. No part of the full grown leaves should ever be destroyed before the fruit is gathered unless they injure each other, by being too much crowded together; for each leaf, when full grown, however distant from the fruit, and growing on a distinct branch of the plant, still contributes to its support; and hence it arises, that when a plant has as great a number of growing fruit upon part of its branches, as it is capable of feeding, the blossoms upon other branches, which extend in an opposite direction, prove abortive.

The variety of *Melon*, which I exclusively cultivate, is little known in this country, and was imported from *Salonica* by Mr. HAWKINS. Its form is nearly spherical, when the fruit is most perfect, and without any depressions upon its surface; its colour approaching to that of gold, and its flesh perfectly white. It requires a much greater state of maturity than any other variety of its species, and continues to improve in flavour and richness, till it becomes externally soft, and betrays some symptoms of incipient decay. The consistence

of its flesh is then nearly that of a Water Melon, and it is so sweet, that few will think it improved by the addition of sugar. The weight of a good *Melon* of this variety is about seven pounds.

XLIII. *On raising* Young Potatoes *in the Winter Months.*

By A. SHERBROOKE, *Esq. of Oxton, in Nottinghamshire.*

Read March 5, 1811.

IN the beginning of May, lay a quantity of the largest Ox-noble Potatoes two or three deep, on a dry cellar floor, and turn them over once in about three weeks, rubbing off all the white sprouts as they appear, but not the spawn or rudiments of the young Potatoes. At the end of September have ready a few boxes; at the bottom of each put six inches of decayed leaves, dried to a vegetable mould, and place upon it a single layer of Potatoes, close to each other; then put another layer of the same mould, six inches deep, then another of Potatoes, and so on till the boxes are full. Set the boxes in a dry covered place, free from frost, never giving them any water. They will produce good fine young Potatoes in December; and those which are ready may be taken off, and the old Potatoes replaced until the remainder of the produce shall be ready.

To obtain a succession, place other Potatoes in vegetable mould, in the succeeding winter months.

XLIV. *A short Account of some* Pears *and* Apples, *of which Grafts were communicated to the Horticultural Society.* By Thomas Andrew Knight, *Esq. F. R. S. &c. President.*

Read March 5, 1811.

Merlet, who wrote in the latter end of the seventeenth century, has described two varieties of the Pear, which were at that period confounded under the name of the *St. Germain:* and Du Hamel has admitted the accuracy of Merlet's account.* These varieties so closely resemble each other in their wood, their buds, their foliage, and blossoms, that it is impossible to distinguish the one from the other; and there is also much similarity in the external character of their fruit. Both varieties are known in this country; but I have seen one only sent from the nurseries round *London*, and that the inferior or spurious kind; and I have, therefore, sent a few grafts of the *true* St. Germain, under the hope that they may prove acceptable to some Members of the Horticultural Society.

The spurious variety ripens in December, and the fruit grown in my garden, and in others in the neighbourhood, remains green when ripe, and generally decays before the end of January; and if the soil and season be not favourable,

* Traité des Arbres fruitiers, tom. 2. p. 227.

it is watery and insipid. The form of the spurious variety, as Du Hamel has remarked, is less long, and subject to much more variations, than that of the true variety. The true St. Germain remains in perfection till the latter end of March, and may be easily preserved till April, and is amongst the very best of the Winter Pears.

If the grafts I send be inserted into the horizontal branches deprived of their barren spurs, of old Pear Trees, on walls, they may be made to afford fruit next year; but for this purpose the grafts must remain nearly as long as the longest scions I send; and they should be inserted as near as possible to the extremity of the branches, and their points be bent downwards, and secured to the wall.

I have long cultivated the two varieties of the St. Germain, and in very different soils; and I formerly supposed the true variety to be the *Louise Bonne* (which Mr. Forsyth has translated, for the "benefit of country gentlemen," the *Good Lewis Pear*); but from that it differs widely in its wood, foliage, and blossom.

These grafts are accompanied with others of some new varieties of *Apples*, which, I believe, deserve culture, and of which I will add a concise description.

The Yellow Ingestrie Pippin. Similar in colour and flavour to the Golden Pippin, but ripens early in October; a very productive variety, and amongst the best of its season.

The Red Ingestrie Pippin. Ripens a fortnight later than the Yellow, and resembles a good deal in colour a very ripe Golden Rennet. This, and the preceding variety, sprang from two seeds of the same Apple, which occupied the same

cell. Their names are derived from Ingestrie, (pronounced Ingstre) the seat of the Earl TALBOT, in Staffordshire.

The Grange Apple. A fruit of great beauty, and similar in colour to a very fine Golden Pippin; it ripens early in October, but remains sound till February.

The Downton Pippin. I have already sent a description and sample of this Apple to the Horticultural Society.* It is equally well calculated for the desert, the press, and for every culinary purpose, where a large size is not required; and I do not know any Apple which can be brought to market, at any given price, with so much advantage to the cultivator. Many of the grafts I send, if inserted in situations properly exposed to the sun, will afford fruit next season.†

The Brindgwood Pippin. Of this variety I have only seen a few Apples, which were very acid when taken from the tree, though apparently quite ripe, but became very excellent in February. Its form and character are those of a large and flat Golden Pippin, with russet stripes. The growth and appearance of the original tree induced me to suppose, that this variety will prove very productive and valuable.‡

The Wormsley Pippin. This Apple ripens in the end of October, and many of my friends think it the best Apple of its season. It is very large, and in the consistence, and juiciness of its pulp, it more nearly resembles the New Town Pippin of America, than any other Apple with which I am acquainted.

* See page 35.

† These four varieties sprang from the same parents—from the seed of the Orange Pippin and the pollen of the Golden Pippin. The original trees are at Wormsley Grange, in Herefordshire.

‡ This variety sprang from the Golden Pippin and Golden Harvey.

The Golden Harvey, or *Brandy Apple*. This variety is generally esteemed in Herefordshire the best fruit of its species, and, I think, with reason. Its season commences in November, and it remains in perfection, with proper attention, till May. It has long been cultivated in Herefordshire, and it has consequently passed the period of youth and vigour; but it is still perfectly well calculated for garden culture. A coloured plate of this variety is given in the *Pomona Herefordiensis*, with that of its offspring, the Siberian Harvey, to which alone it is inferior in richness, and in the high specific gravity of its juice. The Siberian Harvey is of little value except for the press.

XLIV. *Some Account of the* Red Doyenné *Pear. By* Richard Anthony Salisbury, *Esq. F. R. S. &c. Secretary.*

Read April 2, 1811.

One of the objects of the Horticultural Society being to make known, and more certainly distinguish by accurately coloured figures, several valuable fruits, the places of which are too often usurped by inferior varieties, I beg leave to call their attention to a Pear, which I call the *Red Doyenné*.

This excellent Pear is little known, and was some years ago sold by many nurserymen for a new variety. I believe it, however, to be very old, and have little doubt that it has been in England more than a century; for in a large tree of it, taken down at Shawhill, near Halifax, in 1779, I counted eighty annual circles.

Two Pears, of the name of *Denny* and *Dionier*, are mentioned by Worlidge in 1676, but he gives no description of them. This possibly may be one of those; at any rate it is now confounded in our gardens with a very inferior Pear, under the name of *Diana* Pear.

In the magnificent work on Fruit Trees, publishing at Paris by Messrs. Poiteau and Turpin, two Pears are described, and called the *Doyenné* and *Doyenné Roux*. Ours I take to be the latter, but solely from the description; the figure of it, though probably by this time published at Paris, not having yet reached this country. The authors of that work very

The Red Doyenné Pear

properly observe, "That if nurserymen and gardeners would "meet together, as the florists do at *Haarlem*, to agree in "naming a new flower so judiciously, the nomenclature of "fruits would not be so absurd as we often find it." They then add, respecting their *Doyenné Roux*, "what opinion "can we have of him who first called this Pear *Doyenné Gris* "(gray), which has nothing gray about it, but is of a lively "red? yet DUHAMEL, and all subsequent writers, have "adopted this silly name. Thinking it our duty, on this oc- "casion, not to assert what is false, we have not hesitated to "change the name."*

Agreeing perfectly with the sentiments of these celebrated writers on this point, I now proceed to give a short description of our tree.

All those I have seen, have been most abundantly productive, yet vigorous, and forming handsome conical heads, with lateral branches horizontal, and sometimes, in a rich soil, weeping; leaves oval, more or less finely toothed, with very slender footstalks; flower buds conical, the end of the branch under them a little thickened, but not so remarkably as in the common Doyenné Pear tree, the fruit of which, though larger in size, is very inferior in goodness. Flowers slightly tinged with rose colour; but the tint varies, and is, I believe, deeper when the nights are colder than usual, especially if the frost is very sudden: they are about an inch in diameter. Fruit commonly a little turbinated, or top-shaped, sometimes, when they grow in clusters, almost globular, crowned with the permanent leaflets of the calyx, which

* DUHAMEL Traité des Arbres Fruitiers par POITEAU et TURPIN. Sub. Doyenné Roux.

bend inward so as nearly to meet; colour always red when ripe, on the side exposed to the light. It ripens from the end of October to the end of November, continuing in perfection from a fortnight to three weeks: the flesh is pale coloured, melting, and, though not very juicy, agreeably perfumed with a muscat flavour.

Being a great bearer, even in unfavourable seasons, it is a valuable variety to plant in the corner of cottage gardens, and in those of our lesser tenantry, who, by carrying its produce to market, will, in this way, be assisted in paying their rents; and, having seen it ripen well in one of the coldest parts of Yorkshire, not far from the mountains which separate that county from Lancashire, I have no hesitation in recommending it to our fellow labourers in Horticulture at Edinburgh. The only tree known to me near London, is in the garden of Thomas Wheeler, Esq. Gloucester Place, New Road, who accidentally tasting the fruit, purchased the tree itself of a cottager. The figure annexed was drawn from a branch taken from this tree last November.

XLVI. *On the Utility of* Oxygene Air *in promoting Vegetation.*

By Daniel Hill, *Esq. F. H. S.*

Read April 2, 1811.

The two sketches of a *Pelargonium Zonale*, which I have now the honour of exhibiting to the Horticultural Society, are fac-similes of the plant itself, and will give some idea of the utility of *Oxygene Air*, when imparted to the soil around the roots of plants. This plant, in June 1796, was 18 inches high, with few flowers upon it. As the window of my house, in Great Russel-street, where the plant was kept, faces several large breweries, this, like many others during eight successive years, soon drooped, and shewed the badness of the air for vegetation, so that by the middle of July having been drawn weak, and most of its leaves decayed, it was condemned for removal.

Being strongly persuaded that Oxygene Air gave vigour to plants, I determined to try the effect of applying it to the soil of this plant. In the short space of a week, I was gratified with seeing an evident change for the better, all the branches beginning to grow, and from a sickly yellow, its leaves soon resumed their natural green colour. Three strong shoots from the bottom, in six weeks grew up to the top of the old plant, and by the middle of September, it was in the greatest possible health, loaded with flowers, and the largest leaves I had ever seen. The height of the plant, under this treatment, was in

September, 1796, two feet nine inches, and in September, 1797, five feet ten inches, sending out proportionably vigorous lateral branches.

Thus, it appears, that by the use of Oxygene Air, this plant, in an unfavourable situation, grew stronger and more healthy, than it probably would have done in the most favourable situation without Oxygene Air; for, the earth in which it grew, only weighed between five and six pounds; the pot stood in an east window of a room, in which a fire was only kept about six hours out of the twenty-four of each day, so that the frost often penetrated to it: and that of Christmas 1796, was so keen, as to sink a thermometer hung behind the plant several degrees below the freezing point. By a temporary removal, however, into a warmer room, though the plant was greatly injured, it was so far restored to health, as to be full of leaves and flowers by *March* 1797. This healthy state was again checked by a severe frost penetrating into the room, my servant having incautiously left the window open: its flowers were quite blasted, and most of its leaves. From this accident, however, it soon recovered, and is at this moment more than twelve feet high, in the fullest health and beauty.

I have been making experiments for several winters on the roots of Hyacinths, placed in glasses of New River water, by immersing an ounce phial filled with Oxygene Air in the glass with its mouth downwards. These Hyacinths were double varieties, which an eminent seedsman in Fleet-street informed me seldom succeeded in water alone: yet not a single root has ever failed; on the contrary, both the flowers and leaves were bolder and larger, than those of the same plants cul-

tivated in the earth with the greatest care.* During the progress of their vegetation, the Oxygene Air in the phial is gradually absorbed and consumed no doubt by the plant.

I have been enabled to produce Melons of a higher flavour than usual in our climate, and under very unfavourable management in other respects, by applying Oxygene Air to their roots, and have no doubt but it would improve all fruits whatever, as well as enable plants to resist the effects of cold.† In no esculent vegetable, however, are the good effects of this vital air more evident, than in the *Zea Mays*, or *Indian Corn*, as the specimens now exhibited prove, which, though grown in Great Russel-street, equal in size most of those imported from North America.

* These experiments strongly confirm the opinion of our President, stated in the *Philosophical Transactions* of 1808, that the sap of vegetables becomes saccharine, and prepared to generate their new leaves, by the absorption of Oxygene Air. He has also suggested that one of the offices of the alburnous tubes is to admit air.

† The late Mr. FRANCIS MASSON informed me, that he was convinced all the plants which grow wild in the high mountains of Lange kloof, Rogge veldt, and other districts at the Cape of Good Hope, there experience a continued degree of frost every winter, which would kill them in our green-houses; possibly the author's theory may account for this, if it appears from accurate investigation, that the air of those heights is considerably more oxygenated than in lower countries.—*Secr.*

XLVII. *Some Remarks on Pruning and Training standard* Apple *and* Pear *Trees. By Mr.* John Maher, *F. H. S. Gardener to* Daniel Beale, *Esq. at Millfield, near Edmonton.*

Read April 1, 1811.

We often see *Apple* and *Pear* trees, both in gardens and orchards, not only crowded too closely together, but so loaded with their own branches, that very little fruit is produced, and that which is produced, rendered greatly inferior in size and flavour, to what it would be, under different management.

Directions for pruning these, as well as all other Fruit Trees, have already been published by various experienced gardeners, nor is it my present intention to offer any instructions on this head; but necessity, which has been so justly called the mother of invention, having impelled me to try a method that I have not seen practised by any other person, and which has proved uncommonly successful, a short detail of it may perhaps be deemed not unworthy the attention of the Horticultural Society.

When first I came to Millfield, I found a number of Apple and Pear trees, not only planted too closely, but left entirely to their natural manner of growing, and exceedingly shaded by a row of high trees in the hedge, which separates the orchard from the pleasure ground.

Other business to be done, of more importance, prevented me from pruning the whole immediately, but a number were

selected the first season, and many of their largest branches taken entirely out from the bottom, cutting the wounds very clean. The remaining branches were also properly thinned, so as to leave room for the air and light to play upon the smallest branches.

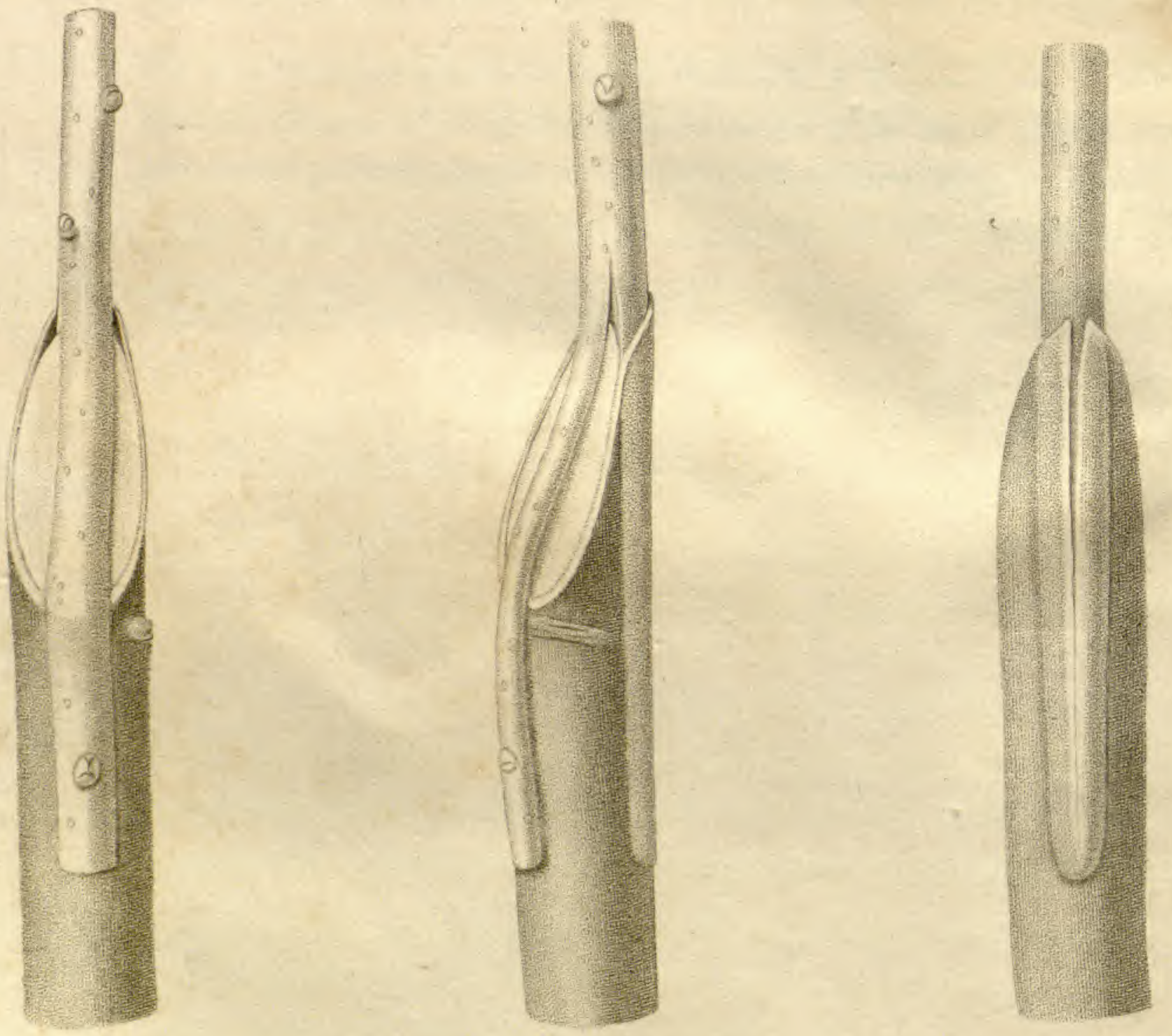
The following summer, the shoots pushed from those pruned trees, as might have been expected, were uncommonly vigorous, such as the French call *gourmands*, often from three to five feet long, or more. About the end of June, or a little sooner and later, according to the growth of the branches, I applied oval balls of grafting clay towards their extremities, sufficiently heavy to incline them downwards in a pendulous direction. The sap being thus diverted from its natural mode of ascending and descending, every bud almost became a blossom bud, and in several trees this disposition to produce blossom buds was carried down to the very lowest spurs on the stem and thicker branches.

I need not add, that this practice has since been closely followed up; for many advantages, exclusive of a more certain crop of fruit attend it. 1st. Other small vegetables may be successfully cultivated under the light shade of trees kept so open, an object of importance in the villages near London, where ground is so difficult to be got. 2dly, No expense of espalier, or of stakes, or of training and tying down the branches is incurred. 3dly, The crop of fruit is not only improved in size and flavour by having so much sun and air, but it is more easily gathered, and suffers much less from the autumnal winds; for branches in this direction are more pliable, and bend more easily to the storm; and as a proof how much may be done by art, if necessary, the branches of

a Lombardy Poplar, accidentally left in my master's orchard, after being loaded with clay balls, became as pendulous as those of the Weeping Willow.*

I have only to add, that most of the specimens of Apples and Pears produced at our meeting in November and December last by me, and honoured with the encomiums of some of the best judges present, grew upon trees kept low and open in this method.

* Our President has shown, in the *Philosophical Transactions* of 1806, the extensive influence of gravitation upon the motion of the sap of plants; and his experiments perfectly support the author's conclusions.—*Secr.*



A Method of Grafting, recommended in page 240.

XLVIII. *Account of two Methods of* Grafting. *By* Thomas Andrew Knight, *Esq. F. R. S. &c. President.*

Read June 4, 1811.

So many different methods of *grafting* are known and practised with success, that it may appear almost useless to point out others. I am, nevertheless, tempted to describe the two following, because the one may be practised with advantage even by the fire-side, and the other in seasons when other modes are not successful.

Transplanting, many years ago, some Pear-stocks from a seed-bed, of which the soil was soft and deep, I found that the first-emitted roots of many of them descended a foot or more perpendicularly into the earth, before they divided into any lateral ramifications: and as I did not like to replant the young trees with such an inconvenient length of root, I cut off about six inches from each. The amputated parts were then accurately fitted and bound, as in splice or whip grafting, to scions of Pear Trees, which were selected as nearly as possible of the same size; and the roots with their attached branches were deposited in the ground as cuttings, so deep, that the whole of the root, and about an inch of the graft or scion, were covered. The soil was then drawn up with the hoe on each side of the plants, which were placed in rows, so that one bud only of each graft was above the soil, and another just within it. These grafts succeeded

perfectly well; and I have subsequently repeated the same experiment with equal success upon the Apple, the Plum, and the Peach. In the greater part of these experiments, the roots were perfectly cleansed from mould by washing, before they were fitted to the graft, and were then placed in wet moss, till a sufficient number were ready to be carried to the nursery; a common dibbler only was employed in planting them; but the mould was washed into the holes with water, to close it well round the roots, and to supply the place of the clay used in other methods of grafting.

As plants of the preceding species of trees are readily obtained by grafting or budding in the ordinary ways, I should scarcely think the account of these experiments worth sending to the Horticultural Society; but that it appears not improbable that many scarce plants, of difficult propagation, may be thus raised by employing the roots of congeners, or even of plants of the same tribe; for if the graft could be fed, though imperfectly, for a few months, it would probably emit other roots within that period. The Moutan might thus be probably increased by being grafted upon the succulent root of the common Pæony; and many other scarce plants, by similar experiments.

The second method of grafting, which I have to recommend, is practised upon small stocks almost exclusively in Herefordshire; but it is never attempted till the usual season of grafting is passed, and till the bark is readily detached from the alburnum. The head of the stock is then taken off, by a single stroke of the knife, obliquely, so that the incision commences about the width of the diameter of the stock below the point where the medulla appears in the section, and ends as

much above it, upon the opposite side. The scion, or graft, which should not exceed in diameter half that of the stock, is then to be divided longitudinally, about two inches upwards from its lower end, into two unequal divisions, by passing the knife upwards, just in contact with one side of the medulla. The stronger division of the graft is then to be pared thin at its lower extremity, and introduced, as in crown-grafting, between the bark and wood of the stock; and the more slender division is fitted to the stock upon the opposite side. The graft, consequently, stands astride the stock, to which it attaches itself firmly upon each side, and which it covers completely in a single season. Grafts of the Apple and Pear rarely ever fail in this method of grafting, which may be practised with equal success with young wood in July, as soon as it has become moderately firm and mature. This method of grafting does not require any previous degree of skill in the operator; and may be executed with considerable expedition, even by wholly inexperienced hands. The annexed engraving will more clearly illustrate it.

XLIX. *Remarks on some* Exotics *planted in the open Air, in Devonshire. In a Letter to the Secretary. By* Abraham Hawkins, *Esq.*

Read December 3, 1811.

Sir,

Your kindness in sending to me a few seeds of the Dahlia Sambucifolia, in order to see how far that plant might be naturalised in Devonshire, surely demands, from time to time, an account of their success. And though I have not absolutely ascertained the fact desired, yet the experiment thus far, seems to proceed satisfactorily. As seeds from a distant part are said to be better than our own produce, I enclose you a few from a plant which has hitherto resisted the frost in the open air.

Though much injury was done to many of the exotics in this neighbourhood, by the rigour of last winter, which, for the short time it lasted, proved the most severe within memory, the plants mentioned in my letter, which appeared in the *Horticultural Transactions for* 1810,* were, in no instance, destroyed, and scarcely, in any, much hurt; but there is one thing remarkable, that numbers of the Platanus Occidentalis have perished; and though I lost none of my own trees, yet their top branches were certainly injured.

At Woodville, the residence of James Yates, Esq. within a quarter of a mile of Salcombe, and close to the sea, is at

* See page 175.

present a very thriving young Agave Americana, about three feet high, which has been in the open ground a few years, it makes rapid progress, and bids fair to rival the memory of the one which flowered in that sea-port above thirty years ago. Mr. YATES has also a wall well clothed with young Oranges and Lemons, which succeed remarkably well.

I have the honour to be,

Your obliged humble servant,

ABRAHAM HAWKINS.

Alston, near Kingsbridge, Devon,
21st October, 1811.

L. *On two early Varieties of the* Potatoe, *and the best Method of forcing them. In a Letter to the Secretary. By* Thomas Andrew Knight, *Esq. F. R. S. &c.* President.

Read December 3, 1811.

My Dear Sir,

I have sent you, to be distributed among the Members of the Horticultural Society, a few *Potatoes* of two of the very *early varieties*, which I have mentioned in a former communication, and described as better calculated for forcing, than any with which I was acquainted.*

The growth of both varieties is extremely dwarfish, so that the tubers ought not to be planted, in the hot-bed, more than six or seven inches from each other; and, if cultivated in the open ground, the rows should not be more than nine inches distant, nor the spaces between the tubers more than four or five.

That which I have marked as *first*, appears to be the earliest of the two, when cultivated in a hot-bed, where its tubers begin to vegetate almost instantaneously, and in which its stems and foliage acquire their full growth in a few days: but in the open ground, I think the *other* is at least equally early; the leaves of it indicated, last year, some disposition to curl, but that disease is easily cured by the means recommended in the *Horticultural Transactions of* 1810.†

The produce of both these varieties of Potatoe, is small, particularly in the open air; but the crop occupies the

* See Horticultural Transactions, page 213. † See page 191.

ground only a very short time; and the quality of both is excellent. I cannot, however, recommend either of them for the markets of the metropolis, where large size and yellowness, without regard to taste or consistence, constitute excellence, and wholly regulate the price of early Potatoes. The tubers of both varieties are below their ordinary size, on account of the almost incessant rain, and coldness of the weather, during the period in which they were growing, and the natural dampness of the soil in which they grew.

With the Potatoes, I send a few *Spanish Chestnuts*, the produce of a young tree that grows here. I have given an opinion in the *Horticultural Transactions of* 1808,* that this fruit might be cultivated by grafting, and by a proper selection of varieties, with very great advantage in this country; and Sir Joseph Banks has subsequently favoured the Society with observations upon the proper culture of it.† The situation in which I live is high, and very cold; and the Chestnut Trees are in consequence almost wholly barren, exclusive of a single tree, which in every moderately favourable season affords very fine fruit, little inferior in size to those imported from the Continent. Those you receive for the inspection of the Members of the Horticultural Society were not selected as the largest; for you will see by their forms, that three generally occupied a single capsule: nor are they in a greater state of perfection than usual, for the spring and early part of the summer, in this part of England, were exceedingly cold and wet; and the annual branches of the Chestnut Trees were much injured by the severity of the frost in April.

The produce of this tree, which I can scarcely suppose the

* See page 62. † See page 140.

best, or earliest, variety in the kingdom, is so great in the very unfavourable situation in which it stands, that I am satisfied that any given quantity of proper ground, planted with such trees, in the warmer parts of England, would support a much larger population, even though half their produce were employed in fattening hogs, than an equal extent of pasture. The tree, which I possess, is about thirty-five years old, and has obviously not been grafted.

I much wish it were in the power of the Society to establish a garden, in which the comparative merits of different varieties of this and other fruits, and of the Potatoe and other esculent plants, could be accurately proved and annually reported. The agriculture of France, under the old and present government, is supposed to have derived considerable advantages from an establishment of this kind, the Jardin des Plantes; and more than equal advantages might arise in this country, where the cultivators of the soil are generally much more enlightened, and always prepared to introduce, and profit by, improvements of every kind. If the most productive variety of the Potatoe alone, and those best calculated for different soils, and seasons of the year, could be dispersed over the island, that alone would prove of no inconsiderable national importance.

I remain, my dear Sir, &c.

THOMAS ANDREW KNIGHT.

Downton,
November 28, 1811.

POSTSCRIPT.

Sir JOSEPH BANKS has recommended jars for preserving *Chestnuts*, of British growth, during winter; and I have tried that method with tolerable success. But I have subsequently found, that both Chestnuts and Walnuts may be preserved through the whole winter, nearly in the state they came from the trees, by covering them with earth, (as Potatoes are usualy covered in the gardens of cottagers), and mingling a sufficient quantity of moderately dry mould with the nuts, to occupy the spaces between them.

LI. *On the Abvantages of employing* Vegetable Matter *as* Manure *in a fresh State. By* Thomas Andrew Knight, *Esq. F. R. S. &c. President*

Read January 6, 1812.

Writers upon agriculture, both in ancient and modern times, have dwelt much upon the advantages of collecting large quantities of vegetable matter to form manure; whilst scarcely any thing has been written upon the state of decomposition, in which decaying vegetable substances can be employed, most advantgeously, to afford food to living plants. Both the farmer and gardener, till lately, thought that such manures ought not to be deposited in the soil till putrefaction had nearly destroyed all organic texture; and this opinion is perhaps, still entertained by a majority of gardeners; it is, however, wholly unfounded. Carnivorous animals, it is well known, receive most nutriment from the flesh of other animals, when they obtain it most nearly in the state in which it exists as part of a living body; and the experiments, I shall proceed to state, afford evidence of considerable weight, that many vegetable substances are best calculated to re-assume an organic living state, when they are least changed and decomposed by putrefaction.

I had been engaged, in the year 1810, in some experiments, from which I hoped to obtain new varieties of the Plum; but only one of the blossoms, upon which I had operated, escaped the excessive severity of the frost in the

spring. The seed, which this afforded, having been preserved in mould during the winter, was, in March, placed in a small garden-pot, which was nearly filled with the living leaves and roots of grasses, mixed with a small quantity of earth; and this was sufficiently covered with a layer of mould, which contained the roots only of grasses, to prevent, in a great measure, the growth of the plants which were buried. The pot, which contained about one-sixteenth of a square foot of mould and living vegetable matter, was placed under glass, but without artificial heat, and the plant appeared above the soil in the end of April. It was three times, during the summer, removed into a larger pot, and each time supplied with the same matter to feed upon; and in the end of October its roots occupied about the space of one third of a square foot, its height above the surface of the mould being then nine feet seven inches.

In the beginning of June, a small piece of ground was planted with Potatoes of an early variety, and in some rows green Fern, and in others Nettles, were employed instead of other manure; and, subsequently, as the early Potatoes were taken up for use, their tops were buried in rows in the same manner, and Potatoes of the preceding year were placed upon them, and covered in the usual way. The days being then long, the ground warm, and the decomposing green leaves and stems affording abundant moisture, the plants acquired their full growth in an unusually short time, and afforded an abundant produce; and the remaining part of the summer proved more than sufficient to mature Potatoes of an early variety. The market gardener may, probably, employ the

tops of his early Potatoes, and other green vegetables substances, in this way, with much advantage.

In these experiments, the Plum-stone was placed to vegetate in the turf of the alluvial soil of a meadow, and the Potatoes grew in ground which, though not rich, was not poor; and, therefore, some objections may be made to the conclusions I am disposed to draw in favour of recent vegetable substances, as manures. The following experiment is, however, I think, decisive.

I received, from a neighbouring farmer, a field naturally barren, and so much exhausted by ill management, that the two preceding crops had not returned a quantity of corn equal to that which had been sowed upon it. An adjoining plantation afforded me a large quantity of Fern, which I proposed to employ as manure for a crop of Turnips. This was cut between the 10th and 20th of June; but as the small cotyledons of the Turnip-seed afford little to feed the young plant; and as the soil, owing to its extreme poverty, could not yield much nutriment, I thought it necessary to place the Fern a few days in a heap, to ferment sufficiently to destroy life in it, and to produce an exudation of its juices; and it was then committed, in rows, to the soil, and the Turnip-seed deposited, with a drilling machine, over it.

Some adjoining rows were manured with the black vegetable mould obtained from the site of an old wood pile, mixed with the slender branches of trees in every stage of decomposition, the quantity placed in each row appearing to me to exceed, more than four times, the amount of the vegetable mould, which the green Fern, if equally decomposed,

would have yielded. The crop succeeded in both cases; but the plants upon the green Fern grew with greatly more rapidity than the others, and even than those which had been manured with the produce of my fold and stable-yard, and were distinguishable, in the autumn, from the plants in every other part of the field, by the deeper shade of their foliage.

I had made, in preceding years, many similar experiments with small trees (particularly those of the Mulberry when bearing fruit in pots), with similar results: but I think it unnecessary to trespass on the time of the Society by stating these experiments, conceiving those I have mentioned to be sufficient to shew that any given quantity of vegetable matter can generally be employed, in its recent and organized state, with much more advantage than when it has been decomposed, and no inconsiderable part of its component parts has been dissipated and lost, during the progress of the putrefactive fermentation.

LII. *On ripening the second Crop of* Figs, *that grow on the new Shoots. By the Right Hon. Sir* Joseph Banks, *Bart. K. B. P. R. S. &c.*

Read January 6, 1812.

As my gardener, * at Revesby Abbey in Lincolnshire, has made an improvement in his profession which appears to me important, I think it my duty to lay an account of it before the Horticultural Society; and I consider it also a duty due to him to add, that the whole has been conducted by his suggestions, and carried into exeution by his personal industry.

An old *Fig Tree*, that had stood more than half a century against a south wall, was used to bear, in good seasons, a moderate crop of what are called first Figs, that is, those that grow from the old wood of the preceding year; but though it produced also abundance of second Figs growing upon the new wood of the present year, none of these ever attained their full size, but all dropped off on the recurrence of cold weather.

As the usual residence of my family in Lincolnshire is during the months of September and October, it became an object of importance to procure a supply of Figs for those months: this could only be done by ripening the second crop, which, though they are matured in warmer countries, are in our climate an useless burthen to the tree.

* His name is James Gardiner.

In order to attempt this improvement, the Gardener was provided with a glass case, large enough to cover the whole of the tree, fitted close upon the wall, and projecting from it in front four feet and a half at the bottom, and two feet three inches at the top. This was warmed by a flue sunk in the wall, and heated by a fire-place fixed under ground, which made one return, and vented its smoke by a chimney at the other end. Within this case was fixed a trellis of wood, between the wall and the front, leaning towards the wall, and to this were trained the branches of the Fig Tree, tied rather loosely to the bars.

In the first week of February the Gardener began his fires, gently bringing the tree into leaf, guarding with the utmost care against frost. When the fruit began to appear from the old wood, he pulled it off; but as soon as any sign of fruit-buds broke out on the new wood, he gave the tree as much air as possible in the day time, carefully covering it up in the night, and protecting it with all possible diligence against any chilling cold.* As the summer proceeded, he gave air in the night as well as the day. In the middle of September some of the Figs were ripe; these proved excellent in flavour. Early in October the crop became abundant, sufficient to afford a regular supply for the table; he then renewed his fires. The October fruit was not at first so soft and luscious as it had been in September, but it was sweet and much approved; some of the Figs gathered on the 31st of October were softer and higher flavoured than the generality of the

* When the Figs on the young wood were about the size of large Pease, the ends of the shoots were pinched off, and not suffered to make more wood Experience must prove whether this practice ought to be pursued.

crop had been; from whence it appears probable, that a proper increase of heat during the ripening of the crop, will much improve the fruit, if not render it quite as good as the summer crop. In fact, the Fig Tree, whose broad leaves hide the fruit almost entirely from the sun, seems to require heat more than light, to bring its fruit to perfection.

POSTSCRIPT.

Since the above was written, I have been informed, by Mr. AITON, that he has, for several years past, practised the forcing of Figs, in the royal gardens of Kew, with great success, and that his chief dependence is upon the second crop. The Fig house is fifty feet long, and has vines on the rafters. In the spring it is used for forcing Cherries, Plums, and Apricots, planted in boxes.

In 1810, Mr. AITON supplied the royal tables with more than two hundred baskets of Figs; about fifty of these were of the first crop, the remainder of the second; these began to ripen in September, and lasted in plenty during the whole of the months of October and November; in one instance, Mr. AITON continued his crop till January, and sent excellent Figs to the palace on the Queen's birth-day, the 18th day of that month.

LIII. *On facilitating the Emission of Roots from Layers.* By Thomas Andrew Knight, *Esq. F. R. S. &c.* President.

Read February 4, 1812.

It is my custom, annually, to repeat every experiment that occurs to me, from which I have reason to expect information either in opposition to, or in favour of, the opinions I have advanced respecting the generation and motion of the sap in trees; and one of these experiments appearing to point out an improvement in the propagation of such trees by laying, as do not readily emit roots by that process, I send the following statement, under the hope that it may be acceptable to the Horticultural Society.

I have cited, in a former communication,* a part of the evidence upon which I have inferred that the sap of trees descends from their leaves through the bark; and I shall here only observe, in support of that opinion, that if a piece of bark be every where detached from the tree, except at its upper end, it will deposit, under proper management, as much, or nearly as much wood, upon its interior surface, as it will if it retain its natural position; and that the sap which generates the wood, deposited in the preceding circumstances, must descend through the bark, as it cannot be derived from any other source.

* Page 219.

When a layer is prepared, and deposited in the ground, the progress of the sap, in its descent towards the original roots, is intercepted upon the side where the partially detached part, or tongue, of the layer is divided from the branch; and this intercepted sap is, in consequence, generally soon employed in the formation of new roots. But there are many species of trees which do not readily emit roots by this mode of treatment; and I suspected that, wherever roots are not emitted by layers, the sap, which descends from the leaves, must escape almost wholly through the remaining portion of bark, which connects the layer with the parent plant. I therefore attempted, in the last and the preceding spring, to accelerate the emission of roots by layers of trees of different species, which do not readily emit roots, by the following means, having detached the tongue of the layers from the branches in the usual manner.

Soon after Midsummer, when the leaves upon the layers had acquired their full growth, and were, according to my hypothesis, in the act of generating the true sap of the plant, the layers were taken out of the soil, and I found that those of several species of trees did not indicate any disposition to generate roots, a small portion of cellular bark only having issued from the interior surface of the bark in the wounded parts. I therefore took measures to prevent the return of the sap through the bark, from the layers to the parent trees, by making, round each branch, two circular incisions through the bark, immediately above the space where the tongue of the layer had been detached; and the bark, between these incisions, which were about twice the diameter of the branch apart, was taken off. The surface of the decorticated spaces

was then scraped with a knife, to prevent the reproduction of the bark, and the layers were recommitted to the soil; and at the end of a month I had the pleasure to observe that roots had been abudantly emitted by every one. In other instances, I obtained the same results, by simply scraping off at the same season, a portion of the bark, immediately at the base of the tongue of the layers, without taking them out of the ground.

By the preceding mode of management, the ascending fluid is permitted to pass freely into the layer to promote its growth, and to return till the period arrives at which layers generally begin to emit roots: the return of the sap through the bark is then interrupted, and roots are, in consequence, emitted; and I entertain little doubt that good plants of trees, of almost every species, may be thus obtained at the end of a single season. I wish it, however, to be understood, that my experiments have been confined to comparatively few species of trees; and that I am not much in the habit of cultivating trees of difficult propagation.

LIV. *Some Account of two new Varieties of* Grape, *each bearing Branches of different Colours. In a Letter to the Secretary. By* THOMAS ANDREW KNIGHT, *Esq. F.R.S. &c.* President.

Read February 4, 1812.

My dear Sir,

I MENTIONED to you, in the last spring, that I had a new variety of *Grape*, which had remained sound and excellent till the 27th of April, without any further care than that of suspending the bunches in a room at the top of my house, which was very damp; and I promised to send a bunch of it to you, during the present winter, for the inspection of the Horticultural Society. A severe frost, however, upon the 3rd of April last, almost wholly destroyed the produce of the only bearing plant I possessed of this variety, no fires having been lighted in the house in which it grew; and a very small bunch, with green berries, the natural colour of the Grape being black, with white stripes, is the only one I am now able to send you. The coloured berries appear to shrivel considerable less than the green, when long kept, possibly owing to the pores of the skin being partially occupied by the colouring matter.

The coloured berries, when the stripes first begin to appear upon them, in ripening, present a very singular and beautiful appearance: and the leaves, which are green during the

The Variegated Chasselas.

summer, become beautifully variegated, with red and yellow, in autumn, whenever the plant grows in a very dry soil, or in a pot. It is a very hardy and productive variety, and bears well in the open air; and in moderately warm situations, it will ripen sufficiently well to afford a very palatable fruit at this season.

I cannot discover any thing in the character of this Grape, which renders it better calculated, than many others, for being long preserved; for its skin is very thin, and it is remarkably juicy; and I am not quite satisfied that the few bunches I have possessed, having remained so long sound, may not be in part, at least accidental. I intended to send some of its variegated leaves with the bunch; but I unfortunately placed them in a book in a damp room, where they became mouldy; and I can send only a single leaf, which was accidentally preserved in my pocket-book. The bunch I send was gathered upon the 10th of October.

This variety sprang from a seed of the White Chasselas, and the pollen of the Aleppo Grape; which readily variegates the leaves and fruit of the offspring of any White Grape.*

I send, as you request, a few cuttings of the plant which afforded the small blue Grapes, with white stripes, which you received from me in the antumn. The same seedling plant bears some bunches of which the berries are black, striped with white; others of which the berries, like those you received, are pale blue, striped with white, each presenting some colourless berries, and other bunches which are perfectly colourless. I believe it will be found to ripen in the open air nearly as well as any Grape we possess, upon plants

* Mr. Knight has named this Grape the Variegated Chasselas.

of the same age; and I think it contains more saccharine matter than any Grape with which I am acquainted, exclusive of the Verdelho Grape of Madeira. This variety is very productive; and will, probably, prove well calculated for early forcing. The berries are generally larger than those you received from me.*

I am, my dear Sir,

Your humble servant,

THOMAS ANDREW KNIGHT.

Downton,
January 30, 1812.

* I believe this little Grape to be better calculated for the press, in a cool climate, than any we now possess, and that, if trained to low walls, in the warmer parts of England, it would afford a wine of considerable strength.

LV. *On the Cultivation of* Rare Plants, *especially such as have been introduced since the Death of Mr.* Philip Miller.

By Richard Anthony Salisbury, *Esq. F. R. S. &c.* Secretary.

Read January 6, February 4, and March 3, 1812.

Amongst the various branches of Horticulture, that of managing *Rare Plants*, though perhaps really the least important, is one of the most difficult; and the avidity with which they are collected, as well as permanent delight which they afford, have advanced the rank of a skilful botanic gardener, in some families, higher than that of any other servant. Many new plants being also introduced, respecting the culture of which no particular directions have yet been published, I very willingly communicate to this Society what little knowledge I have gained on the subject.

If my remarks eventually prove useful to any one, let his thanks flow in a full stream towards the royal garden at Kew, which has been the grand source of horticultural improvement, in this country, since the death of Mr. Philip Miller. How would that Prince of Gardeners, as he was emphatically called by foreigners, have been gratified to have joined us in our excurson last June, when we saw the whole of that vast collection, in the various quarters of the *Grass*, *Physic*, *Kitchen*, *Fruit*, *Flower*, and *Pleasure* ground, whether under extensive ranges of glass, or exposed to the open air, in the neatest order, and healthiest condition; and when we saw living

more than double the number of exotic plants known to him in 1768? How would he have been still more delighted to have witnessed his own liberal principles descending, and emanating in the son of his favourite pupil, who then distributed so largely amongst us all, bulbs of the magnificent *Lilium Tigrinum*; and who, upon being asked by your Secretary for a plant still more rare, told him, in the very words of Mr. PHILIP MILLER to BOERHAVE's gardener, to "help himself to whatever he wished for"?

Nothing is stated in the following pages that is not the result of my own experience: but it would be very ungrateful in me not to mention, next to the names of the late Mr. AITON and his son, those of Messrs. LEE and KENNEDY; and of Mr. DONN, who after being the right hand of his master for so long a period at Kew, has raised the Cambridge garden to a degree of clelebrity it had never attained before: by all of whom, many hints and instructions, now fully detailed, were originally given. For much valuable matter, relative to the soil and places of growth of Cape and West India plants, always communicated without the slightest reserve, and so essential to the working gardener, I am indebted to the late Mr. FRANCIS MASSON. Still more lately, I have gained a great deal of useful knowledge of this sort, from the manuscript tickets of Mr. JAMES NIVEN, who travelled several years in various districts of the Cape, at the expense of GEORGE HIBBERT, Esq. From that gentleman's gardener also, Mr. JOSEPH KNIGHT, who in so short a period brought his master's late collection, at Clapham, to a state of unrivalled beauty, and now labours, as successfully, on his own account, at Little Chelsea, I have learnt many points necessary

to be attended to. In one tribe of plants, the succulents, very few remarks will be found ; but those few are confirmed by the practice of ADRIAN HARDY HAWORTH, Esq. our most successful cultivator of them.

I have quoted the names of the plants as they occur, first in the two great Natural Classes of *Monocotyledones*, and *Dicotyledones ;* and next according to their *Natural Orders ;* which will hereafter, I doubt not, prove the best practical, as well as scientific, method: for nothing can be more puzzling to an unlearned gardener, than the sexual system, or indeed any artificial system whatever : all of which break in pieces with more or less violence, that chain, so many links of which, in my humble opinion, the great Creator of the universe has left to us, in these latter days of the earth, still continuous and unbroken. The most ignorant labourer, who has once seen a *Pea* blossom, or its pod, has no difficulty in ascertaining the Order of most of the plants in that vast natural assemblage, and soon learns to read, with equal facility, those legible characters, written by the finger of God, on the *Mosses*, *Ferns*, *Grasses*, *Rushes*, *Palms*, *Lilies*, *Asphodels*, *Hemlocks*, *Pinks*, *Mallows*, &c. It is well known how congenial the sentiments of Mr. PHILIP MILLER were to my own, on this head; and how long he held out, before he would exchange the characters of TOURNEFORT, for the more perfect ones of LINNÆUS, in his *Dictionary*. Yet those of LINNÆUS, as far as the genus is concerned, are already completely superseded by the characters of JUSSIEU; and a work relative to species, disposed after the same method, whenever it is published, will as rapidly subvert the Herculean labours of WILLDENOW. When no mention of a plant has

been made in any work, or when, in my opinion, it has been placed in a wrong genus, I have quoted the name by which it is distinguished, in my own MSS.

I cannot conclude these few preliminary observations better, than in the words of the great gardener so often mentioned, "that having delivered my sentiments with unreserved freedom, I hope to be pardoned for any faults in the style; and that whatever errors may have crept in, I shall be ready to expunge upon information from any judicious person."

CLASSIS

I.

MONOCOTYLEDONES.

JUNCĒÆ.

LUZULA ALBIDA. *Decand. Syn. p.* 150. Juncus albidus. *Hoffm. Fl. Germ. p.* 126. Juncus angustifolius. *Wulfen in Jacq. Collect. v.* 3. *p.* 56. Juncus leucophobus. *Ehrh. Beitr. v.* 6. *p.* 141. Juncus niveus. *Leers. Fl. Herb. p.* 90. *t.* 13.

I received seeds of this plant, collected on some of the high mountains of Hungary, by Dr. TOWNSON, in 1793, which came up three years after they had been gathered; and it is probably the *Juncus spicatus* of his Travels. On the paper they were in, was written, "seeds eaten by the peasants;" but I neither found them larger, nor better flavoured, than others of the genus. It grows readily in any soil.

LUZULA LUTEA. *Decand. Syn. p.* 150. Juncus luteus. *Villars Fl. Delph. v.* 2. *p.* 235. *t.* 6. Juncus planifolius, &c. *Hall.*

Hist. n. 1329. Juncoides latifolium alpinum glabrum paniculâ luteâ splendente. *Scheuchz. Agrost. p.* 314.

A rare alpine species, with bright yellow petals, which flowered last August, in the Comtesse DE VANDES' collection at Bayswater: here it is as easily cultivated as any other species, and would be a great ornament to our grass plats.

JUNCUS MARITIMUS. *Brown Prodr. p.* 258.—*Decand. Syn. p.* 151.—*Smith in Engl. Bot. n.* 1725. *cum Ic.*

Several plants of this species came up in my court, two years ago, from seeds collected at Port Dalrymple, in the island of Van Dieman; but though one of these stood the first winter, it has been killed by the little frost of the last. The plant had flowered abundantly, and it might have been the case with the indigenous one of our own coasts.

LOMANDRA LONGIFOLIA. *Labill. Nov. Holl. v.* 1. *p.* 92. *t.* 119. Xerotes longifolia. *Brown Prodr. p.* 262.

This plant lived through two winters in the open ground at Mill Hill. I received the seeds from Port Jackson, in 1796, with the title of Brandy Bottles, and its flowers exhale a strong vinous smell, like those of Nymphæa Lutea. It is easily propagated by offsets; but is so ugly and prickly a plant, that few people will preserve it here.

PANDANĒÆ.

PANDANUS HUMILIS. *Jacq. Fragm. p.* 21. *t.* 14. *f.* 2. Pandanus polycephalus. *Lamarck in Encycl. Bot. v.* 1. *p.* 367. Pandanus odoratus. *Prodr. p.* 3.

I purchased this species of Messrs. LEE and KENNEDY in 1789, who had raised it, many years before, from seeds

collected in the Isle of Bourbon, where it grows wild; its tender leaves having been destroyed by the carelessness of a workman, who let a pot full of paint fall into the heart of it, the stem divided into three branches, which a few years after emitted roots as thick as my little finger, at some distance above the earth: two of these branches being taken off close to the stem, made healthy plants quickly; and thus we know how to encrease it. All the species of Pandanus are noble shewy trees, but only fit for stoves of large dimensions, where they can be planted in a bed of earth, and even then will hardly flower till they have attained a great age.

DRACONTĒÆ.

ARUM MUSCIVORUM. *Linn. Suppl. p.* 410. Arum crinitum. *Willd. Sp. Pl. v.* 4. *p.* 477.

Among some specimens gathered in the Chelsea garden, in the year 1769, by the late Mr. HUDSON, a leaf of this plant is one. It thrives better in the open border, than when confined in a pot, being quite hardy; but it delights in a dry bottom.

ARUM BULBIFERUM. *Prodr. p.* 260. Arum ternatum. *Thunb. Fl. Jap. p.* 233.

Introduced by JOHN FOTHERGILL, M. D. in 1774, among the earth of a *Rhapis Flabelliformis.* It is a pretty little plant, so hardy as to live under a frame without fire-heat, but now rarely to be met with in our collections. In autumn the leaves decay, and do not appear again till the following spring, soon after which it flowers, and encreases abundantly by a bulb formed at the top of every leaf-stalk.

CALADIUM HELLEBORIFOLIUM. *MSS.* Arum helleborifolium. *Jacq. Collect. v.* 3. *p.* 217.—*Ic. Rar. t.* 613.

In many of our stoves, this plant has been confounded with *Arum Venosum*. The two plants are, indeed, very similar; but this produces several leaves from each root, *Arum Venosum* I believe never more than one. It grows wild in the woods of Caracas, and was introduced by the Marchioness of Rockingham, in 1796.

Pothos Cordata. *Ait. in Hort. Kew. ed. 2. v. 1. p. 269.* Arum acinis, &c. *Plum. Ic. p. 26. t. 38.*

This was pointed out to me by the late Dr. Hope, under a fine *Brucea Antidysenterica*, as one of the choicest plants in the Botanic Garden at Edinburgh, when I first visited that university: he informed me, that it had been raised from seeds, which he took from a dried specimen gathered in the island of Martinico, in 1768. It thrives in our stoves with little care, but is difficult to increase except by seeds; these, however, ripen here upon old plants.

Symplocarpus Fœtidus. *MSS.* Pothos fœtidus. *Sims in Bot. Mag. n. 836. cum Ic.* Dracontium fœtidum. *Linn. Sp. Pl. ed. 2. p. 1372.*

This plant will succeed in any border of rich earth, though it is said to be an aquatic: and it is one of the rare plants which I found left in the garden at Mill Hill, by Mr. Peter Collinson. The flowers come out naked before the leaves, and are often succeeded by ripe fruit.

POTAMOGETĒÆ.

Triglochin Bulbosum. *Ker in Bot. Mag. n. 1445.—Jacq. Collect. Suppl. p. 102.—Ic. Rar. v. 2. t. 454.—Linn. Mant. p. 226.*

Introduced in 1802, from the Cape of Good Hope, where

it grows wild, by GEORGE HIBBERT, Esq. The greatest beauty of this plant is in its large plumose stigma; and it may be cultivated under a common frame, only requiring protection from severe frost.

BUTOMĒÆ.

DAMASONIUM AUSTRALE. *MSS.* Actinocarpus minor. *Brown Prodr. p.* 343.

This plant flowered in Mr. WOODFORD's stove, not long before he left this country, and was purchased at his sale by Messrs. LEE and KENNEDY. As I did not see the ripe fruit, I referred it to TOURNEFORT's genus of *Damasonium*, which name has been very unwarrantably transferred by SCHREBER to another aquatic; but from the specific character in the learned work above quoted, the fruit splits differently to that of *Damasonium*, and if so, it will constitute a distinct genus. The plant, at Springwell, was cultivated in a cistern of water, and appeared very healthy.

SAGITTARIA LANCIFOLIA. *Kenn. in Bot. Repos. n.* 333. *cum Ic.—Willd. Sp. Pl. v.* 4. *p.* 410.

This fine aquatic grows wild in the islands of St. Domingo and Jamaica, extending itself as far as South Carolina, on the neighbouring continent. It was introduced, in 1800, by GEORGE HIBBERT, Esq. and may be preserved, with very little heat, during the winter; but will not thrive in summer, without more heat than the open air of our climate affords.

HYDROCHARIDĒÆ.

HYMENOTHECA LATIFOLIA. *MSS.* Damasonium Indicum. *Ker in Bot. Mag. n.* 1201. *cum Ic.—Willd. Sp. Pl. v.* 2.

p. 276. Stratiotes alismoides. *Smith Ex. Bot. v.* 1. *p.* 27. *t.* 15.

A tender aquatic, which thrives so well in a pan of water with a little mud at the bottom, that no stove ought to be without it. The flowers appear in succession during the whole summer; and it may be propagated by seeds, which ripen here, and come up plentifully round the mother plant, if the soil is not disturbed. It was introduced by Sir BROOKE BOOTHBY, Bart. about 1788, in whose stove at Ashborn, in Derbyshire, I first saw it.

BROMELĒÆ.

BROMELIA AQUILEGA. *Par. Lond. n.* 40. *cum Ic.* Bromelia bracteata. *Swartz. Fl. Ind. Occ. v.* 1. *p.* 583. Aloe americana, &c. *Houst. Reliq. p.* 7. *t.* 16.

Young plants of this were sent to me accidentally among some Pine Apple seedlings, in 1786, from the island of Jamaica; one of these flourished exceedingly, while I resided at Chapel Allerton, but never flowered. It was cultivated in a large pot plunged in a bark-bed, under the shade of taller plants: and having attained such a size, that all its leaves, collectively, held about a gallon of water, it would no doubt, at last have shot up a magnificent panicle. To make it flower sooner, perhaps, the roots ought to be confined in a small compass, and little water suffered to remain in the bosom of its leaves, keeping the plant in the hottest temperature. It grows wild on old trees, or rocks, and must be propagated by seeds, the plant dying, as Mr. BIGGS informs me, after it has ripened them, without sending out suckers.

PITCAIRNIA SULPHUREA. *Kenn. in Bot. Rep. n.* 249. *cum Ic.* Pitcairnia bracteata β. *Ker in Bot. Mag. n.* 1416. *cum Ic.*

A native of the island of St. Vincent, and more tender than the other species in our stoves, requiring to be plunged constantly in the bark-bed, where it should have no water at all during winter.

TILLANDSIA CALAMIFOLIA. *MSS.*

I believe that only three plants of this species are in the kingdom, they were received by the Marchioness of BUTE from Brasil, in 1796, with the name of *Bonapartea*. Of these, one is now in the collection of JAMES VERE, Esq.; another, purchased at the late Mr. CHARLES GREVILLE's sale, in that of Messrs. JENKINS and GWYTHER; and the third in that of Messrs. LEE and KENNEDY.* They are all cultivated in pots, on a shelf of the stove, and seem very healthy, but have not yet flowered. As the whole plant consists of a large head of leaves with one central bud, sending out no suckers, it probably can only be increased by seeds, or branches formed under the flower-stalk.

PONTEDERĒÆ.

PHILYDRUM LANUGINOSUM. *Brown Prodr. p. 265 et 299. —Sims in Bot. Mag. n. 783. cum Ic.* Garciana Cochinchinensis. *Lour. Fl. Coch. p.* 15.

A curious annual, which grows wild in bogs. The best method of treating it here, is to sow the seeds, about *September*, in pots of rich earth, placed on the front flue of a stove, and kept very moist. In *March* transplant the young seedlings into separate pots, which as the plants advance, should be plunged in a cistern of water; and at the end of

* A great number of young plants has been lately introduced (*Sept.* 1814) from France, by Mr. JOSEPH KNIGHT, of Little Chelsea.

June, some of these may be turned out to take their chance in any warm pond. I formerly placed this genus at the end of *Hæmodorēæ*, from the structure of its anther, and to which order it surely approaches nearer than to *Juncēæ*: a luxuriant flower, however, with three divisions in its perianthium, and three fertile filaments, for which I am indebted to that excellent gardener, Mr. WILLIAM ANDERSON, has suggested a still closer affinity to some plants of this order.

COMMELINĒÆ

ZYGOMENES AXILLARIS. *MSS.* Tradescantia axillaris. *Linn. Mant. p.* 321. Commelina axillaris. *Linn. Sp. Pl. ed. 2. p.* 62.

I received seeds of this plant from the celebrated Sir WILLIAM JONES, soon after he arrived at Calcutta. KOENIG says it is annual, which it perhaps may be, there; but in our stoves it is rendered truly perennial, by being propagated from cuttings, and not suffered to flower too abundantly.

APHYLAX SPIRALIS. *MSS.* Commelina spiralis. *Linn. Mant. p.* 170.

An annual, discovered by KOENIG, in moist places, in Hindostan, which flowered at Kew in 1786, where it had been raised from seeds, sent by him to Sir JOSEPH BANKS. It was preserved in this country, many years after, by Mrs. GREEN, of Bursted, near Billericay, who was so well known for requesting "cuttings with a bit of a root to them;" and whose memory deserves to be cherished by all true botanists, for having cultivated such trifling plants, to serve them, as nobody else would.

Callisia Repens. *Willd. Sp. Pl. v.* 1. *p.* 254.

Though Mr. Philip Miller does not mention this plant, it was cultivated in the Chelsea garden in 1756, as appears by a specimen, which he then gave to Dr. Milner of Leeds. It has little beauty, and is only interesting to those who study generic differences.

Tradescantia Crassifolia. *Par. Lond. n.* 59. *cum Ic.* —*Cav. Ic. v.* 1. *p.* 54. *t.* 75.

This plant grows wild about the city of Mexico, near rills of water, much in the way that *Veronica Beccabunga* does here. It is so handsome, that I made an attempt to cultivate it in my court, which being exposed to the south, is very hot in summer; and it succeeded perfectly well from June till the middle of September: but it then declined, though the average temperature of the following month was much hotter than usual, being 58 degrees of Fahrenheit. The flowers are very fragrant, like those of *Heliotropium Peruvianum*.

HELICONĒÆ.

Musa Coccinea. *Kenn. in Bot. Rep. n.* 47. *cum Ic.*

Introduced in the year 1791, from China, by Thomas Evans, Esq. It succeeds in our stoves with litle trouble, flowering when three or four feet high, though confined in a pot, and sending up off-sets abundantly.

Heliconia Psittacorum. *Sims in Bot. Mag. n.* 502. *cum Ic.*—*Swartz. Obs. p.* 98.

This plant agrees with *Heliconia* in only having a single seed in each cell of its fruit, which ripened in the collection of the Dowager Lady De Clifford. It grows wild

in moist shady places of the highest mountains in Jamaica, flowering with us in August and September, if planted in a very large pot of rich earth; and it may be increased by off-sets.

HELICONIA BIHAI. *Ait. in Hort. Kew. 2. ed. v. 2. p. 24.* —*Jacks. in Bot. Rep. n.* 640. *cum Ic.*

This species grows wild in shady gullies, of the cooler mountains in Jamaica; where the soil is rich and moist; and it attains the height of ten or twelve feet, flowering during two or three months in spring. It seldom thrives in our stoves, for want of room; as it requires either a very large tub, well drained, or to be planted in a corner of the bark-bed, and its fibres suffered to run in the decaying bark. With this treatment it not only flowered, but ripened fruit, at Harewood House, in Yorkshire, in 1780, where it had been raised from seeds some years before: they are transversely wrinkled, and very similar to those of *Maranta arundinacea.*

STRELITZIA AUGUSTA. *Dryand. in Hort. Kew. 2. ed. v. 2. p.* 55.

One of the grandest plants of this Natural Order; the foot-stalks of its leaves forming a shaft from twenty to thirty feet high. It is more tender than many plants from the south of Africa, growing wild along the banks of rivulets near Plettenberg's Bay, where it forms whole forests. It sends up offsets freely, when not confined in a pot, and flowers from February to May at Kew, where it was introduced in 1796, by Sir JOSEPH BANKS.

STRELITZIA REGALIS. *MSS.* Strelitzia Reginæ. *Dryand. in Hort. Kew. 2. ed. v. 2. p.* 55.—*Curt. in Bot. Mag. n.* 119, 120. *cum Iconibus.*

I regard all the plants, which the late Mr. DRYANDER has separated from this, as mere varieties, and the last of them as a monstrosity, analogous to a cow without horns. We find as striking differences in the foliage of many other vegetables, some growing low and spreading, others tall and slender; and this not from standing remote, or close to one another, but from a natural predisposition, evident in the seed-bed. This species was first discovered very near the south point of Plettenberg's Bay, and it grows wild, still more abundantly, about the mouth of the Great Fish River. Being now common in our collections, its treatment is pretty well understood; but it is not generally known that its seeds, which are very curious and beautiful, may be readily obtained here by the following method: Keep the plant as cool as possible without injury to its health, during winter, for the later it flowers in April or May, the better. As soon as the stigma of the first flower is fully grown, dust it with a little pollen, either of the same flower, preserved dry in writing paper for that purpose, or of the next flower ready to open; if the stigma do not shrivel, the day after, repeat this dusting, and so proceed with all the remaining flowers. At the same time take away nearly all the honey from the nectarium of each flower, with a small bit of sponge tied to a stick of a camel's hair pencil, and perform this operation neatly, as the Certhias do with their long bills, not daubing the flower. During summer and autumn, expose the plant to all the sun our climate affords, keeping the stove as hot as possible, consistent with a due admission of fresh air.

CANNĒÆ.

Sect. 1.

CANNA FLACCIDA. *Ait. in Hort. Kew. 2. ed. v.* 1. *p.* 2. —*Stirp. Rar. p.* 3. *t.* 2.—*Decand. in Pl. Lil. n.* 107. *cum Ic. bonâ.*

From a specimen of this plant, gathered at Orford, in Lancashire, in 1778, it probably was introduced by JOHN BLACKBURN, Esq. It is seldom seen in the collections near London, requiring, like the *Canna glauca*, a good deal of moisture. They both used to ripen seeds every year at Chapel Allerton, where they were cultivated in large pots, plunged half way up in a tub of water, which stood in a glass frame, but had no fire-heat, except in exceedingly severe frost.

THALIA DEALBATA. *Ait. in Hort. Kew. v.* 1. *p.* 3.—*Fraser's Ic.*

A most beautiful aquatic, and introduced earlier than is supposed; for I examined it in the collection of ALEXANDER, then Lord LOUGHBOROUGH, at Woburn Farm, in Surrey, in 1786: he purchased it of Mr. JOHN CREE. Neither is it very tender, as it flowers every summer in the ponds of many gardens near London, especially at JAMES BROGDEN's, Esq. Clapham, where it ripens fruit, and is more luxuriant than I have ever seen it; so that it might probably be naturalised in such of our waters as are so deep in winter, that the frost could not penetrate to its roots.

MARANTA ARUNDINACEA. *Ait. in Hort. Kew. 2. ed. v.* 1 *v.* 2.

The culture of this valuable root is not well understood by gardeners in general, though perfectly easy. It only requires a light rich soil, and little or no water, after the leaves decay. About April, or as soon as there is any appearance of vegetation again, water it moderately. With this treatment it used to flower every year with me, even in a very small pot; and last autumn, it ripened plenty of seeds in the stoves at Sion House. Dr. HOUSTON found it truly wild near La Vera Cruz.

CLINOGYNE DICHOTOMA. *MSS.* Phrynium dichotomum. *Roxb. in As. Res. v.* 11. *p.* 7.

I believe this shrub is in no collection here at present, except that of Messrs. JENKINS and GWYTHER, nurserymen, who purchased it at the sale of the plants of the late Right Hon. CHARLES GREVILLE. He received seeds, in 1804, from the island of Pulo Penang, where it grows wild in moist ground, which produced plants that flowered two years afterwards. It has the habit of *Maranta arundinacea*, but is not herbaceous, and may be easily propagated by cuttings.

HYMENOCHARIS OBLIQUA. *MSS.* Maranta obliqua. *Rudge Pl. Guian. p.* 8. *t.* 2.

Introduced by his Majesty, late in the autumn of 1803, having been purchased from the captors of a French vessel. I saw it flowering imperfectly in the following December; but as it is omitted in the second edition of the *Hortus Kewensis*, now publishing, this plant is probably dead: the only wonder is, that Mr. AITON should have been able to preserve so many of those Guiana plants, at such a season, after the neglect and rough treatment they had experienced from our British tars.

Sect. 2.

COSTUS VAGINALIS. ***MSS.*** Costus arabicus. *Willd. Sp. Pl. v.* 1. *p.* 2. Costus glabratus. *Swartz. Prodr. p.* 2. Costus. *Linn. Hort. Cliff. p.* 2.

From a catalogue of exotics in the garden of Dr. RICHARDSON, at North Bierly, in Yorkshire, who is supposed to have had the first hot-house erected in that county, it appears that he received this plant from Leyden, as early as the year 1736. By him it was soon increased, and communicated to a younger physician, and fellow student of his son's, while in Holland, Dr. MILNER of Leeds; who, though he had only a large green-house, contrived to preserve many tender plants in a deep bark-pit, lined with stable-dung, in winter. In this bark-pit, where through neglect, it had been permitted to occupy a large space, it flowered at last, in the year 1768; when JOHN BLACKBURN, Esq. being informed of the circumstance, by one of his sons, settled as a merchant at Leeds, came over from Orford, to see it: In Dr. MILNER's garden, among other botanists of less note, he found assembled the celebrated Dr. FOTHERGILL, then on a visit to his nephew, a linen draper in the town; old Mr. THOMAS KNOWLTON, from Londesborough; Mr. EWBANKE, a skilful druggist from York; and Mr. JAMES BOLTON, from Halifax, who had been sent for, to make a drawing of the plant, which, through the kindness of the late Sir WILLIAM MILNER, Bart. is now in my possession. Being then a boy, I also, with some difficulty, obtained leave to remain in the garden, where I had been long anxiously waiting, and I have a clear recollection of great debates arising

whether it was *Costus dulcis*, or *Arabicus*: for all agreed in thinking that it must be one, if not both of them, though unquestionably this species produces neither of those justly exploded drugs. Not many years after this period, Dr. MILNER's eyes became very dim, but he retained a strong affection for his plants to the last: and I have often had the delight of leading that venerable old botanist to feel and smell at his *Laurus Camphora*, *Eriocephalus*, *Tarchonanthus*, *Schinus molle*, *Ceratonia*, *Erica arborea*, *Chamærops humilis*, *Pelargonium cucullatum*, *capitatum* and *gibbosum*, when he could hardly distinguish them in any other way. Some time before his death, being no longer able to walk to his garden, he presented me with many of his green-house plants; and the individual *Chamærops* above mentioned, which he had received from Mr. PHILIP MILLER in 1756, after being in my collection till 1798, and for a shorter time in Sir WILFRED LAWSON's, is still living in the botanic garden at Liverpool. His more tender plants, which he was very anxious to have preserved in the county, he offered to Lord Viscount IRWIN, who, at his seat of Temple Newsham, in that neighbourhood, had built a large stove for Pine Apples, but devoted the flues to tender exotics. There, accordingly, this *Costus* was removed, with *Zingiber officinale*, *Kæmpferia Galanga*, *Pancratium amœnum*, *Hæmanthus puniceus*, *Brunswigia*, *Amaryllis Reginæ*, and *Gloxinia*; which last plant, though now so difficult to cultivate, I well remember used to flower most abundantly in that bark-pit, every autumn. Some useful hints, I trust, will be taken from this long history, relative to the culture of both the species of *Costus* now in the stoves about London, and many other plants, which seldom, if ever,

flower with us. I would plant them in a narrow border of rich earth, at the back of a low bark pit, suffering the stems to extend their own way, and the roots to strike their fibres into the decaying bark. In summer, while vegetation is active, I would give plentiful waterings; but none at all in winter, at which season, though the stems remain green, most of their leaves are withered. Any degree of cold, approaching to frost, should be also prevented by gentle fires, as well as by those superior methods of glazing and covering, which every skilful gardener now adopts.

GISSANTHE SPIRALIS. *MSS.* Alpinia spiralis. *Jacq. Hort. Schonbr. v.* 1. *t.* 1 Paco Caatinga clavâ rubente major. *Plum. MSS. v.* 5. *t.* 34.

Introduced by THOMAS EVANS, Esq. from the island of St. Vincent in 1797, where it grows wild in moist woods. I have seen it in many stoves under the name of *Costus speciosus;* but though very similar, the leaves of this are more glossy on their upper surface. No small share, both of heat and moisture, are necessary to make it flower.

ZINGIBERĒÆ.

Sect. 1.

RENEALMIA NUTANS. *Kenn. in Bot. Rep. n.* 360. *cum Ic.* Globba nutans. *Vent. in Pl. Lil. n.* 60. *cum Ic.* Alpinia nutans *Smith Ex. Bot. p.* 93. *t.* 106 Zerumbet speciosum. *Wendl. Sert. Hann. t.* 19.

Of all these names for one and the same plant, I think it safest at present to adopt the first; for, the President of the Linnean Society, in his work above quoted, informs us, that

the original specimens of LINNÆUS' *Renealmia exaltata*, "agree precisely in the structure of their flowers, so as to be "unquestionably of one genus." I am very confident, however, that it will not be joined by future botanists to *Alpinia* of PLUMIER, the flowers and fruit of which I have twice examined living; first at Kew, many years ago, and afterwards in my own stove at Chapel-Allerton. *Renealmia nutans* is now a common ornament of our stoves, yet rarely produces fruit, which may, however, be obtained, with certainty, by impregnating the stigma, and taking away the honey; and, exclusive of the pride which every gardener ought to have in making all the plants under his care ripen fruit, the genus of this, and the two following plants nearly allied to it, cannot be determined without ripe fruit; which I therefore invite those who belong to this Society, to strive to ripen, and communicate either to myself, or to Mr. ROBERT BROWN, librarian to the Linnean Society. It is of very little consequence who the labourer is that squares the stones for a temple, if he does his work well.

RENEALMIA MUTICA. *MSS.* Alpinia mutica *Roxb in As. Res. v.* 11. *p.* 37.

A plant exceedingly similar to the last, which corresponds nearly with Dr. ROXBURGH's description above quoted, has now flowered, for three years successively, in the stove of the Comtess DE VANDES, at Bayswater. It has not, however, produced fruit, so that I cannot be quite positive about their indentity: but as it is equally magnificent, and seems quite unnoticed, I am glad of this occasion to make it known. Mr. FORDYCE, the gardener, informs me that they both thrive with the same treatment.

Renealmia Calcarata. *How. in Bot. Rep n.* 421. *cum Ic.* Most probably a native of China, and not of Bengal; for I have seen a pretty accurate drawing of it, made at Pekin. If so, it may succeed in the open ground.

Hellenia Allughas. *Jacks in Bot. Rep. n.* 501. *cum Ic.* —*Willd. Sp. Pl. v.* 1. *p.* 4.

For a specimen of this plant, which, I believe, was first introduced by Aylmer Bourke Lambert, Esq. in 1804, I am indebted to his librarian, the late Mr. Jackson. At least I never saw it in any of our collections, where I have long kept a sharp eye on the plants of this Natural Order. It flowers without much difficulty in the bark-bed, liking a rich moist soil, and would probably ripen fruit by a little of such attention, as is recommended under *Strelitzia Regalis.*

Galanga Officinalis. *MSS.* Maranta Galanga. *Linn. Sp. Pl. ed.* 2. *p.* 2. Alpinia Galanga. *Willd. Sp. Pl. v.* 1. *p.* 12.

This was certainly at Kew, in March 1802, where I saw it flowering, and received a small branch of the panicle from my liberal friend Mr. Aiton. I then supposed it to be *Hellenia Allughas*, by which name also the late Mr. Dryander had returned it; but not to mention other differences discovered afterwards upon comparing it with the real *Hellenia Allughas*, the germen of this has only two seeds in each cell.

It is no doubt, a native of the East Indian Islands, yet being there likewise generally cultivated, I have not been able to ascertain any place in which it grows wild. The plant with us requires constant heat and moisture.

Ethanium Racemosum. *MSS.* Alpinia racemosa. *Swartz. Obs. p.* 5. Alpinia Jamaicencis. *Gærtn. Fruct. v.* 1. *p.* 36. *t.* 12. *f.* 3.

A most beautiful genus, confounded by PROFESSOR SWARTZ with *Alpinia Racemosa* of LINNÆUS, though he observes that PLUMIER's figure does not correspond with this plant. I purchased it of Messrs. LEE and KENNEDY in 1795, and it both flowered and ripened seeds under the shade of taller plants, in the bark-bed at Chapel Allerton, growing to the height of five or six feet. The fruit is very different from that of *Alpinia*.

GETHYRA OCCIDENTALIS. *MSS.* Alpinia occidentalis *in Hort. Kew. ed.* 2. *v.* 1. *p.* 4.

This plant has been longer in the country than is mentioned in Hortus Kewensis, for I saw it flowering in the double-roofed stove at King's Weston, in August 1778. It is one of the most valuable plants of this Natural Order, the seeds being agreeably aromatic, like those of *Cardamomum officinale*, from which genus this differs principally in the nectarium. It grows wild in the moist woods of Jamaica.

CARDAMOMUM OFFICINALE. *MSS.* Amomum cardamomum. *White in Linn. Trans. v.* 10. *p.* 229. *cum Ic.* Elettaria cardamomum. *Maton in Linn. Trans. v.* 10. *p.* 254. *cujus synonyma completissima.*

As this important spice-plant is already in the botanic garden at Liverpool, it is to be hoped we may see it at Kew; but for fear that plant should die, I especially mention it, to stimulate the Directors of our East India Company to order both ripe capsules, and living plants, in pots, to be sent here, and properly attended to during the voyage, by some one of those captains of their ships, to whom they give opportunities of amassing such immense fortunes. We have amongst our Members, one gentleman who is a Director,

and if he would establish this plant in the stoves near London, it might be exported to the Island of Jamaica, in the cooler shady mountains of which, it would probably thrive as well as in Malabar. It there grows wild on the summits of lofty mountains, enveloped in clouds, or deluged with rain, nine months of the year; and under the shade of trees, which admit but a small portion of the sun's beams.

Margona Paludosa. *MSS.* Amomum angustifolium. *Sonner. Voy. v.* 2. *p.* 242. *t.* 147.

Introduced by William Manning, Esq., of Totteridge, in whose collection it flowered in October 1804, but was lost the following winter, with several other choice plants, for want of heat. It grows wild near ponds, and constitutes a very distinct genus, which I have named after a celebrated Italian druggist, who has written on Cardamoms. As the Isle of Bourbon is now in the possession of Great Britain, I hope we shall soon have this plant at Kew.

Torymenes Officinalis. *MSS.* Amomum elatum. *Prodr. p.* 5. Amomum Granum Paradisi. *Linn. Sp. Pl. ed.* 2. *p.* 2.

Francesco Borone, whose name has been so deservedly perpetuated by the President of the Linnean Society, collected a number of seeds and roots, for that gentleman, at Sierra Leone, which arrived here quite fresh in August 1792. On a label to one of the roots, which proved to be this plant, was written " from Cape Apollonia, for him you love best." Being then in London, Dr. Smith gave it to me, and I very gratefully record this proof of the friendship subsisting between us at that period. Though the plant flourished

exceedingly at Chapel Allerton, it did not flower till after I had left that place, probably from my dividing its roots too often, being anxious to encrease so curious a plant; but the late Sir WILFORD LAWSON, who purchased my collection, was so obliging as to send me two specimens.

ALEXIS GRANDIFLORA. *MSS.* Amomum grandiflorum. *Smith Ex. Bot. v. 2. p.* 163. *t.* 111.

Introduced by THOMAS FURLY FORSTER, Esq. in 1794, who raised it from seeds gathered at Sierra Leone, by Professor AFZELIUS. It differs from the true *Amomum*, both of old and modern botanists, very materially, in the structure of the fruit; nor have I yet examined any plant, from the same country, which can be joined either to that genus, or *Margona*. It sends up off-sets abundantly, and the best time to divide them is in the end of February or beginning of March.

ALEXIS BIFURCA. *MSS.* Amomum exscapum. *Sims in Ann. Bot. v.* 1. *p.* 549. *t.* 16.

Introduced by Mr. CONRAD LODDIGES at the same time with the preceding; in his stove it has repeatedly flowered, and requires the same treatment.

ZINGIBER LURIDUM. *Par. Lond. n.* 119. *cum Ic. nondum ed.* Zingiber casumunar. *Sims in Bot. Mag. n.* 1426. *cum Ic.* —*Roxb. in As. Res. v.* 11. *p.* 347. *t.* 7. Amomum Zanthoriza. *Roxb. MSS. n.* 511. Car Pus-poo *Hindostanis.*

This species grows wild in moist vallies of the Circars, from whence it was sent, in 1807, to the late Right Hon. CHARLES GREVILLE. It flowered in his stove the year after, and a description of it was then printed for the *Paradisus*

Londinensis, which now, possibly, Mr. Hooker will never publish. It thrives here with the same culture as the other *Zingibers*, and is as easily propagated.

Sect. 2.

Curcuma Aromatica. *Par. Lond. n.* 96. *cum Ic.* Curcuma Zedoaria. *Roxb. in As. Res. v.* 11. *p.* 5. Gaidoar, sive Zedoarium alterum, &c. *Camel. Syll. p.* 23. Jungli-haldi *Bengalensibus.*

An old inhabitant of our stoves, being introduced by Sir Joseph Banks, in 1797. The plant is easily cultivated, but will not flower here without a large pot, and being kept dry after the leaves decay; that from which the figure in *Paradisus Londinensis* was drawn, having stood, at my request, on the back shelf of the stove without water from November till March.

Curcuma Officinalis. *MSS.* Curcuma Zerumbet. *Roxb. in As. Res. v.* 11. *p.* 16. Amomum Zerumbet. *Retz. Obs. fasc.* 3. *p.* 35. Zerumbet. *Rumph. Herb. Amb. v.* 5. *t.* 68. Tomon *Malayensibus.*

This is the true *Zedoary* of the shops, according to the opinion of Mr. Charles Greville, who took a great deal of pains to ascertain this point, and who received roots of it from Calcutta, in 1807. Off-sets from those are now in several stoves about London, but have not yet flowered, to my knowledge.

Curcuma Æruginosa. *Roxb. in As. Res. v.* 11. *p.* 8. Zedoaria, &c. *Camell. Syll. p.* 23.

Introduced with the preceding species in 1807, by the

late Right Hon. CHARLES GREVILLE, and it is now in the collection of Messrs. JENKINS and GWYTHER, where it flowered last June.

CURCUMA LONGIFLORA. *MSS.* Curcuma rubescens. *Roxb. in As. Res. v.* 11. *p.* 19.

This species was introduced by ROBERT WILLIAMS, Esq., in 1805, in whose stove one of the imported roots flowered twice, the following year, both before the leaves appeared, and again from the middle of the leaves in autumn. I believe it is more tender than many others, all the plants at Mill Hill having perished by too much wet after the leaves decayed. Off-sets however from a plant, which I luckily brought to Mr. CHARLES GREVILLE, are now in many collections about London.

KÆMPFERIA PLANTAGINIFOLIA, *MSS.* Kæmpferia Galanga. *Sims in Bot. Mag. n.* 850. *cum Ic.—Linn. Sp. Pl. ed.* 2. *p.* 3. Kæmpferia sessilis. *Koenig. in Retz. Obs. fasc.* 3. *p.* 62.

A native of mountainous districts beyond Chittigong, from whence the roots are brought down to the Bengal markets by the JUMMA MUGS: it is pretty hardy, if kept dry after the leaves decay; for I cultivated it several years before I had a stove, in my father's kitchen window. I have no guess what induced LINNÆUS to give it the erroneous name of *Galanga.*

KÆMPFERIA VERSICOLOR. *MSS.* Kæmpferia rotunda. *Sims in Bot. Mag. n.* 920. *cum Ic.—Linn. Sp. Pl. ed.* 2. *p.* 3. Kæmpferia longa. *Jacq. Hist. Schonbr. v.* 3. *p.* 37. *t.* 317.

From a painting of this plant, made by EHRET for the late Marquis of BUTE, I find that it was introduced by that

nobleman, so long ago as 1760. It grows wild in the woods of Hindostan, flowering there, as well as here, in April and May, just before the leaves appear. In our stoves it succeeds better on a shelf than in a bark-bed; the moist warmth of the latter exciting the roots into action, too soon, in spring.

ORCHIDĒÆ.

Sect. 1.

Diplectrum Cucullifolium. *MSS.* Satyrium cucullatum. *Swartz. in Act. Holm.* 1800. *p.* 206 Orchis bicornis. *Linn. Sp. Pl. ed.* 2. *p.* 1330.

Two bulbs of this species flowered at Kew, in 1787, with one of which, and many other rare plants, the late Mr. Aiton enriched my collection. I preserved it some years, by attending to his directions of planting the bulb in a pot, nearly full of broken tiles mixed with pure sandy loam, and keeping it quite dry when not vegetating.

Pterygodium Volucre. *Swartz. in Act. Holm.* 1800 *p.* 218. Ophrys volucris. *Linn. Suppl. p.* 403.

For this curious plant I was indebted to Sir Joseph Banks, who received it in a bag of seeds and bulbs collected at the Cape in 1796, the whole of which he gave to me. The imported bulb flowered once at Chapel-Allerton, and also increased, its longer fibres terminating in a small bulb; a mode of propagation which I shall have occasion to notice in many plants that have no affinity to each other. These small bulbs, however, made little or no progress afterwards, and never flowered, though they went on multiplying exceedingly. It is not a tender species; for, at last, tired of potting

them, I planted some bulbs, which I brought with me to Mill Hill, in the open border, under the green-house, where they lived three years before they finally dwindled away. If we knew the soil and situation in which the plant grows wild, probably it might be cultivated with more success.

Disperis Secunda. *Swartz. in Act. Holm.* 1800. *p.* 300. Arethusa secunda. *Thunb. Prodr. p.* 3. Ophrys circumflexa. *Linn. Sp. Pl. ed.* 2. *p.* 1344.

Introduced with the preceding in 1797, by Sir Joseph Banks. It only lived one year, though kept dry after the stem and leaves decayed.

Disa Spatulata. *Swartz in Act. Holm.* 1800. *p.* 213. Satyrium spatulatum. *Thunb. Prodr. p.* 5. Orchis spatulata. *Linn. Suppl. p.* 398.

Introduced by George Hibbert, Esq. in 1805. This plant is not a difficult one to manage, for it flowered two years successively at Clapham ; and I have since seen it in Messrs Lee and Kennedy's nursery. The flowers are of a dirty olive colour ; leaves numerous, narrow, and very unlike most of this Natural Order.

Disa Cornuta. *Swartz. in Act. Holm.* 1800. *p.* 210. Satyrium cornutum. *Thunb. Prodr. p.* 5. Orchis cornuta. *Linn. Sp. Pl. ed.* 2. *p.* 1330.

This also flowered at Clapham, in Mr. Hibbert's collection, in 1805, and would have been figured by Mr. Andrews, in the *Botanist's Repository*, but it was thought not to be sufficiently advanced when he saw it ; its petals, however, I believe never do expand much, for the plant was very healthy, and afterwards swelled its capsules.

Lysias Bifolia. *MSS.* Habenaria bifolia. *Brown Prodr.*

p. 312. Orchis bifolia. *Smith in Engl. Bot. n.* 22. *cum Ic. bonâ.* —*Linn. Sp. Pl. ed.* 2. *p.* 1331.

One of our indigenous plants, which may be cultivated without any difficulty, if planted in pure loam from a limestone bottom. It succeeds in a pot, if filled half full of broken tiles; and when in the open ground, the border should be well drained, at least six inches in depth. No plant bears forcing better, or exhales a more delightful perfume. I have never observed this species but in a limestone soil, and it is exceedingly plentiful near Buxton.

ORCHIS PYRAMIDALIS. *Smith in Engl. Bot. n.* 110. *cum Ic. malâ.*—*Linn. Sp. Pl. ed.* 2. *p.* 1329.

This species also forces well, and will thrive in any garden, if cultivated in the way recommended for the last plant.

ORCHIS PAPILIONACEA. *Linn. Sp. Pl. ed.* 2. *p.* 1331.

I saw several plants of this flowering at Oxford in 1796, where they had been brought by the late Dr. JOHN SIBTHORPE, from the hills near Naples.

MYODIUM ARANIFERUM. *MSS.* Ophrys fuciflora. *Curt. in Fl. Lond. fasc.* 6. *t.* 67. Ophrys aranifera. *Smith in Engl. Bot. n.* 65. *cum Ic. pessimâ.*

This, and most of its congeners, are very easily cultivated; but require the purest loam from a chalky bottom, and the border to be most effectually drained; for any permanent wet in summer makes them push too soon. On the hillocks and declivities where they grow wild, the slight showers are absorbed by the surrounding turf or long grass, and the heavy rains we usually have, after Midsummer day, run off quickly.

SERAPIAS LINGUA. *Linn. Sp. Pl. ed.* 2. *p.* 1344.

Introduced at Chapel-Allerton in 1797, having been purchased of Messrs. GRIMWOOD and Co. who received the roots from Turin. It flourished exceedingly, and is probably still at Mill Hill, where I took and left it.

SERAPIAS CORDIGERA. *Jacks in Bot. Rep. n.* 475. *cum Ic.* —*Linn. Sp. Pl. ed.* 2. *p.* 1345.

Introduced by the Marquis of BLANDFORD in 1806. I saw it much increased at White Knights, in May 1809, five or six plants then flowering in the same pot. Both in this and the preceding species, a bulb is formed annually at the end of the larger fibres, as in *Pterygodium Volucre.*

STRATEUMA MILITARIS. *MSS.* Orchis militaris. *Smith in Engl. Bot. n.* 1873. *cum Ic. bonâ. Linn. Sp. Pl. ed.* 2. *p.* 1333.

I found this plentifully last summer in a dry pasture near Chalfont, in Buckinghamshire.

STRATEUMA GRANDIS. *MSS.* Orchis (fusca) militaris. *Smith in Engl. Bot. n.* 16. *cum Ic. malâ.* Orchis fusca. *Jacq. Fl. Austr. v.* 2. *t.* 176. *optimâ.* Orchis purpurea. *Huds. Fl. Angl. ed.* 1. *p.* 334.

These two species succeed best in chalky soil, free from all manure whatever; but they will endure more moisture than I could have supposed, for I found them in a very wet part of the meadow, below the terrace, at Mill Hill, where they had, no doubt, been planted by Mr. PETER COLLINSON. *Orchis Conopsea* affords another singular instance of this sort, which I have seen growing wild on the dryest limestone, mixed with *Orchis Pyramidalis*, and in bogs where I could hardly tread, mixed with *Epipactis Palustris.*

SATYRIUM BRACTEALE. *MSS.* Orchis bractealis. *Par.*

Lond. n. 110. *cum Ic.* Orchis bracteata *Willd. Sp. Pl. v.* 4. *p.* 34.

Introduced, in 1805, by Messrs. NAPIER and CHANDLER, nurserymen, of Vauxhall, from whose plant the figure in *Paradisus Londinensis* was drawn. It thrives in any loamy soil, like *Satyrium Viride*, to which it is nearly allied, liking to be kept rather moist at all seasons. A careful examination of all the *Orchidēæ* I could meet with last summer, especially of our indigenous species, has convinced me that LINNÆUS's genus of *Satyrium* must be restored.

IBIDIUM SPIRALE. *MSS.* Ophrys spiralis. *Smith in Engl. Bot. n.* 541. *cum Ic.* Neottia spiralis. *Swartz. Fl. Ind. Occ. v.* 3. *p.* 1408.

No plant whatever is more easy to cultivate than this. At Chapel-Allerton it propagated itself every where, springing up from seeds in the neighbouring pots, whatever soil or plants happened to be in them; and I once found them germinating on a dead root of Persian Cyclamen, in a pot, which, for want of draining, was full of *Jungermannias.*

IBIDIUM ELATUM. *MSS.* Neottia minor. *Kenn. in Bot. Rep. n.* 376. *cum Ic.* Satyrium elatum. *Swartz. Prodr. p.* 119.

This was introduced into the Chelsea garden in 1790, by Mr. JOHN FAIRBAIRN, and grows wild in moist shady places of the Island of Jamaica: it of course requires a stove here, but has little beauty to recommend it.

IBIDIUM SPECIOSUM. *MSS.* Neottia speciosa. *Sims in Bot. Mag. n.* 1374. *cum Ic. Kenn. in Bot. Rep. n.* 3. *cum Ic. in plerisque exemplaribus perperam fucatâ.—Jacq. Ic. Rar. v.* 3. *t.* 600. *Coll. v.* 3. *p.* 174.

In the works above quoted, this plant is directed to be

kept constantly in the bark-stove, which is right; but I have always found it thrive better on the flues, than when the pot is plunged in the bark-bed; and it grows wild on the very highest mountains of Jamaica, where it flowers in November. It was introduced by Sir Brook Boothby, in 1790.

Ibidium Crystalligerum. *MSS.* Neottia orchioides. *Sims in Bot. Mag. n.* 1036. *cum Ic.—Swartz. Fl. Ind. Occ. v.* 3. *p.* 1411.

One of the most beautiful plants of this genus, introduced by E. I. A. Woodford, Esq. in 1806, from the Island of Barbadoes, where it grows wild in the most arid places among grass. It requires, nevertheless, moderate waterings here, while the leaves are green. As the original *Neottia* of Dodonæus is a legitimate genus, parasitic on the roots of trees, I have adopted a name for these plants, suggested by the late Mr. Dryander, from the resemblance of their anther to the head of an Ibis.

Ophrys Ovata. *Smith in Engl. Bot. n.* 1548. *cum Ic.* Epipactis ovata. *Swartz. in Act. Holm.* 1800. *p.* 232.

This species is very common in a limestone soil, but will grow almost any where; and was so luxuriant in bog earth, under a large *Rhododendrum Ponticum* of the Right Hon. Charles Greville's, that several spikes, from one cluster of roots, measured between two and three feet in height.

Malaxis Liliifolia. *Swartz. in Act. Holm.* 1800. *p.* 236. Ophrys liliifolia. *Kenn. in Bot. Rep. n.* 65. *cum Ic.—Linn. Sp. Pl. ed.* 2. *p.* 1341.

Among other treasures which I found at Mill Hill ten years ago, when I purchased Mr. Peter Collinson's villa there, were several of these plants growing near the edge of the pond

under a *Dirca Palustris*. It is a native of North America, in similar situations, and certainly had been naturalized there by that eminent collector, perhaps so long since as the year 1758, when, as appears from the *Philosophical Transactions* of 1763, it was introduced.

Ornithidium Coccineum. *MSS.* Cymbidium coccineum. *Sims in Bot. Mag. n.* 1437. Epidendrum coccineum. *Linn. Sp. Pl. ed. 2. p.* 1348.

A parasitic on old trees, near torrents, in the Island of Martinico, its fibrous roots insinuating themselves into the crevices of their moist bark. Here it thrives exceedingly, in pots filled with the same, flowering at various seasons, but chiefly in October and November. During summer it should be placed in a shady part of the stove, and often sprinkled with water; but it requires little or none in winter, especially when plunged. The Labellum approaches nearer to that of *Dendrobium* than *Cymbidium;* but I have no doubt that it is a distinct genus from both.

Epidendrum Fragrans. *Swartz. Prodr. p.* 123. Epidendrum cochleatum. *Curt. in Bot. Mag. n.* 152. *cum Ic.*

A parasitic on decayed trees in the Island of Jamaica, first introduced in 1778, by Francis Goldney, Esq. of Clifton, and I brought it to Kew the following winter.

Epidendrum Cochleatum. *Sims in Bot. Mag. n.* 572. —*Willd. Sp. Pl. v.* 4. *p.* 114.

A parasitic on old trees and damp rocks in the Bahama Islands, Jamaica, and Martinico. Both these *Epidendrums* are very easily cultivated in our stoves, the moist heat of the bark-bed appearing to afford nearly all the nutriment they require. I do not see them, however, now so healthy as they

used to be with me at Chapel-Allerton, where they ripened seeds, which germinated plentifully on every damp pot they happened to be blown upon, and often on the surface of the tan-bed; they were there planted in pots quite full of broken tiles, mixed with knobs of old bark which had not been in the tan-bed, but taken fresh from Gledhow wood.

Auliza Ciliaris. *MSS.* Epidendrum ciliare. *Linn. Sp. Pl. ed. 2. p.* 1349.

Of the rare exotics among the *Orchidēæ*, none deserve a place in our stoves more than this, which was introduced by Messrs. Whitley and Brames, nurserymen of Brompton, in 1797. It is likewise parasitic, if a plant, which merely grows upon, without being nourished by the sap of another, can be called so. It should be planted in pots, filled with porous stones, a few decayed leaves, and knobs of bark taken fresh from the woods: but it requires very little water; and if the leaves turn yellow, it is a sign they have either too much wet, or too much sun. With such treatment, by keeping four or five pots of it, the stove will be enlivened with their long tubular flowers, slowly succeeding one another, at most periods of the year. It is easily propagated by dividing its stems.

Amphiglottis Secunda. *MSS.* Epidendrum elongatum. *Sims in Bot. Mag. n.* 611. *cum Ic.* Epidendrum secundum. *Jacq. Hist. Amer. p.* 224. *t.* 137.

Introduced by E. I. A. Woodford, Esq. in 1800, in whose stove it flowered most of the following summer, being very easily kept and propagated.

Amphiglottis Lurida. *MSS.* Epidendrum fuscatum. *Smith Spicil. p.* 21. *t.* 23. Epidendrum anceps. *Jacq. Hist. Amer. p.* 224. *t.* 138.

Introduced, in 1790, by Sir Brooke Boothby, from the Island of Jamaica, where it is parasitic in the woods; thriving very well, like the last, in our stoves.

Oncidium Undulatum. *MSS.* Oncidium carthagenense. *Swartz. Fl. Ind. Occ. v.* 3. *p.* 1479. Epidendrum undulatum. *Sims in Bot. Mag. n.* 777. *cum Ic.*—*Swartz. Prodr. p.* 122.

Introduced in 1802, by E. I. A. Woodford, Esq. in whose stove at Vauxhall, it flowered the following June; and a few years after, when removed to his villa, near Rickmansworth, it ripened fruit. This is, I understand, rather more difficult to cultivate than the others, requiring a constant smart damp heat, but no water at all.

Aeridium Odorum. *MSS.* Aerides odorata. *Lour. Fl. Coch. v.* 2. *p.* 642.

For this singular species, the labellum of which resembles a little pitcher, we are also indebted to E. A. I. Woodford, Esq. who received it from Ceylon in 1806. It flowered soon after its arrival, and may be propagated by cuttings.

Myrobroma Fragrans. *Par. Lond. n.* 82. *cum Ic.* Vanilla planifolia. *Lambert in Bot. Rep. n.* 538. *cum Ic. bonâ.* Epidendrum rubrum. *Lamarck in Encycl. Bot. v.* 1. *p.* 178. Vanilla fl. albo fructu breviore corallino. *Plum. Gen. p.* 25. *MSS. v.* 3. *t.* 300.

In the *Botanist's Repository*, it is asserted, that I have confounded this species with the *Epidendrum Vanilla* of Linnæus.* It was discovered by Father Plumier, in the Island

* That late excellent botanist, Mr. Jackson, who had the care of Mr. Lambert's herbarium, was so hurt upon seeing the paragraph, that he called immediately to assure me he was not the author of it.

of St. Domingo, where it grows wild, climbing to the tops of the highest trees; and is easily preserved in our stoves, throwing out one or more roots at every leaf, but as it seldom flowers here, I would recommend the following treatment. Plant it at one end of a low bark stove, the temperature of which must be kept constantly hot and damp, never below 60 degrees of FAHRENHEIT, in the night, during winter. Let the earth be fat loam, taken about an inch deep from the surface, in some old wood: mix this with a few decayed leaves, and small pieces of rotten sticks, either in a tub bored full of holes, and sunk at the back corner of the bark pit; or pale off a space of two square feet for it, draining the bottom a foot in depth very effectually, with hollow tiles and porous stones. Select a healthy young plant to place in this earth; and, as soon as it pushes vigorously, divide the stem, by pinching off its top, into three or four principal branches, which train backwards and forwards over that end of the bark-pit, at two inches and a half distance from each other, on stout rods, of a rough-barked elm, nailed firmly across. The roots, which issue from the bottom of the stem or branches, must be suffered to penetrate into the earth, where they will swell and nourish the plant; but if those beyond attempt to strike downwards, wind them gently along the elm rods, to which they will soon cling by small fibres, like those of Ivy. When the principal branches have extended to fifteen or twenty feet in length, divide them again, by pinching their tops, as you find it necessary, into about a dozen branches in all, which must be left to flower, guiding them first horizontally, and afterwards in every possible direction, upon smaller rods of rough-barked Elm, stuck into the bark-pit, at various

angles. From the 20th of March to the 20th of September, shade that end of the stove by the light foliage of a *Passiflora Normalis*, trained all over the top, but pruned so thin as to admit the rays of the sun to play on the bed underneath. I prefer this method to a mat, for many reasons. Let the earth be always damp by gentle sprinklings of water, but never very wet, except in the great heats of summer, when I should be inclined to give the plant two or three drenching showers all over, from a fine-rosed watering-pot, shutting up the house at night full of steam. Besides these hints, which I presume to offer to so many able gardeners, another yet remains to be mentioned, without a close attention to which, all labour, in the cultivation of this and every other plant, will be in vain; that is, to suffer no insects to attack them: neither is this difficult. Aphides, the Green and Black Lice, may be destroyed as soon as they appear, by a few clouds of tobacco smoke. Coccus Adonidum, the Mealy Insect, is so tender, as to be killed by the slightest pressure of a soft brush. Coccus Hesperidum, the Brown Turtle Insect, requires more labour, and a wet sponge: but if the plants infested are often fumigated with tobacco-smoke, it sickens that insect also, especially the very young ones; as I can speak from repeated experience at Chapel-Allerton. Acorus Telarius, the Red Spider, often so terrible a scourge to our tender exotics, cannot exist a moment in an atmosphere where sulphur, in a volatile state, is suspended: and a very small quantity washed upon the flue where it is warm, but not very hot, suffices: for that substance must never be ignited. Thrips, the Skipping Insect, is the most difficult to subdue,

but it fortunately attacks very few plants: a very soft brush, in a brisk wind, is the only remedy known to me.

DENDROBIUM BARRINGTONIÆ. *Smith Ic. Hict. n. 25. cum Ic.*

Introduced by the Hon. Mrs. BARRINGTON from the Island of Jamaica in 1790, and, as I am told, one of the most difficult species to cultivate, requiring the constant damp heat of a bark-pit, but little or no water.

CYMBIDIUM FRAGRANS. *MSS.* Epidendrum Sinense. *Sims in Bot. Mag. n.* 888. *cum Ic.*—*Kenn. in Bot. Rep. n.* 206. *cum Ic.*

A most fragrant plant, one spike of flowers filling the whole stove with perfume, like that of the Persian Iris. I doubt its being indigenous in China; for it is tender; and I never saw it healthy, except when plunged in the bark-bed, where it flowers freely, sending up numerous off-sets.

CYMBIDIUM ALOIFOLIUM. *Swartz. in Nov. Act. Ups. v.* 6. *p.* 73. Epidendrum alooides. *Curt. in Bot. Mag. n.* 387. *cum Ic.* Epidendrum aloifolium. *Linn. Sp. Pl. ed.* 2. *p.* 1356.

Introduced by JOHN DEVAYNES, Esq. in 1792, from the coast of Malabar, where it is parasitic on the trunks of *Strychnos Nux Vomica;* in our stoves will thrive on a shelf, as well as in the bark-bed.

OTANDRA CERNUA. *MSS.* Limodorum recurvum. *Roxb. Pl. Corom. v.* 1. *p.* 33 *t.* 39.

This species flowered, in 1794, in the collection of JOHN SLATER, Esq. at Laytonstone, who introduced it the same year from the Rajamundry Circar, where it grows wild in moist vallies; it may be cultivated in our stoves, with little trouble.

Pachyne Spectabilis. *MSS.* Limodorum Incarvillei. *Pers. Syn. v. 2. p.* 520. Phaius grandifolius. *Lour. Fl. Coch. v. 2. p.* 647. Limodorum Tankervilliæ, *Dryand. in Hort. Kew. v.* 3. *p.* 302. *t.* 12.

The first plant, which flowered in this country, was cultigated at Apperly Bridge, near Bradford, in Yorkshire, in May 1776, and had been sent there to Mrs. Hird, by her uncle, Dr. Fothergill, in a black Chinese pot, full of stiff loam, in which it had been imported. Many small bulbs, with leaves like those of a Snow-drop, grew near the edge of the same pot in a regular circle, and these afterwarda proved to be *Amaryllis Aurea.* The *Pachyne Spectabilis* delights in warmth, fresh loam, and plenty of water, by which treatment, and attention to fecundate the stigma, it will ripen fruit here abundantly.

Gyas Verecunda. *MSS.* Cymbidium verecundum. *Willd. Sp. Pl. v.* 4. *p.* 165. Limodorum altum. *Sims in Bot. Mag. n.* 930. *cum Ic.* Limodorum tuberosum. *Jacq. Collect. v.* 4. *p.* 115. Limodorum trifidum. *Michaux Fl. Bot. Am. v.* 2. *p.* 159. Helleborine, &c. *Ph. Mill. Ic. p.* 97. *t.* 145.

I cultivated this species in a common bark-pit, without any fire-heat, many years, where it was more luxuriant than I have ever seen it since, throwing out peduncles four and five feet long, with many branches. It grows wild in the Bahama Islands.

Gyas Florida. *MSS.* Limodorum purpureum. *Vent. in Pl. Lil. n.* 83. *cum Ic.* Limodorum floridum. *Prodr. p.* 9. Epidendrum tuberosum. *Linn. Sp. Pl. ed.* 2. *p.* 1352. Helleborine, &c. *Plum Ic. t.* 186. *f.* 2.

This is much more tender than the former, and requires a

stove. It grows wild in the woods of Jamaica, from whence I received the roots in 1786, and it is now in most of the collections about London.

Gyas Humilis. *MSS.* Cymbidium hyacinthinum. *Smith Ex. Bot. p.* 60. *cum Ic.*

Introduced by Thomas Evans, Esq. in 1802, from the Island of Trinidad, where it grows wild. This is also a tender species, and only producing four or five flowers in a spike, very like those of the last; though somewhat larger, it is not so much esteemed, and I fear will soon be lost.

Cathea Pulchella. *MSS.* Cymbidium pulchellum. *Willd. Sp. Pl. v.* 4. *p.* 105. Limodorum tuberosum. *Linn. Sp. Pl. ed.* 2. *p.* 1345.—*Curt. in Bot. Mag. n.* 116. *cum Ic. optimâ.*

This genus approaches nearer to Arethusa than to the last, both in flower and fruit: and though it grows wild from South Carolina up to Canada, I have not been able to make it succeed here in the open air. It was introduced accidentally, as Mr. Curtis informs us, by the laudable exertions of his gardener, who, in the spring of 1783, examining attentively the bog-earth which had been brought over with some *Dionæas*, found several tooth-like knobby roots, which, upon being planted in heat, afforded this plant. On the shelf of a stove, or in a bark-pit, it thrives exceedingly; and I believe merely requires a longer and hotter summer, than our climate affords.

Arethusa Bulbosa. *Linn. Sp. Pl. ed.* 2. *p.* 1346.

Introduced by Dr. Fothergill in 1778, as appears from a drawing made by Miss Lee, daughter of the celebrated nurseryman. It grows wild, in bogs, as far north as Halifax,

in Nova Scotia, whence I received two roots in 1806. One of these flowered the following year; but though both were planted in their native earth, and kept constantly moist, neither of them appeared again.

Cytherea Borealis. *Par. Lond. n.* 89. *cum Ic.* Limodorum boreale. *Swartz. in Willd. Sp. Pl. v.* 4. *p.* 122. Cymbidium boreale. *Swartz. in Nov. Act. Ups. v.* 6. *p.* 76. Cypripedium bulbosum. *Smith Spic. p.* 11. *t.* 11.—*Linn. Sp. Pl. ed.* 2. *p.* 1347.

Introduced at Mill Hill, in 1806, along with the last plant, and equally difficult to cultivate. I would advise any one, who is so lucky as to obtain either of them hereafter, to plant the roots in a bog wet enough for *Drosera Longifolia*, which came up in the soil sent with them from Nova Scotia.

Peramium Repens. *MSS.* Satyrium repens. *Smith in Engl. Bot. n.* 289. *cum Ic.* Neottia repens. *Swartz. in Act. Holm.* 1800. *p.* 226. Epipactis foliis, &c. *Hall. Hist. Helv. n.* 1295. *t.* 22.

This is one of the rarest indigenous plants of our island, but not difficult to cultivate; for it lived and flowered many years in Sir Brooke Boothby's garden, near Lichfield. It grows wild in fir-woods, and succeeds best in sandy peat, not much exposed to the rays of the sun, especially if the mosses and smaller weeds, which naturally spring up, are not removed too frequently. About once a year, a little fresh sand, mixed with very decayed leaves, should be scattered over the border.

Sect. 2.

Cypripedium Parviflorum. *Sims in Bot. Mag. n.* 911.

cum Ic.—Willd. Sp. Pl. v. 4. *p.* 144.—*Linn. Trans. v.* 1. *p.* 79. *t.* 3. *f.* 2.

Introduced in 1776, by JOHN FOTHERGILL, M. D. and will thrive in any shady border of light vegetable earth, mixed with sand.

CYPRIPEDIUM HUMILE. *Willd. Sp. Pl. v.* 4. *p.* 144.—*Linn. Trans. v.* 1. *p.* 79. *t.* 3. *f.* 4. Cypripedium acaule. *Michaux Fl. Bor. Am. v.* 2. *p.* 61.

Of the four *Cypripediums* in our gardens, this is the only one which I have never been able to cultivate successfully. Mr. PHILIP MILLER, after observing that they are with difficulty preserved and propagated, recommends them to be planted in a loamy soil: but they will hardly exist in loamy soil. On the contrary, in a border of peat-earth, mixed with decayed leaves and sand, I had them flowering and encreasing without interruption, for a number of years; so that I was often able to give a plant to my neighbours. This species, however, though variously treated, always died the second or third year after being imported; perhaps it delights in a very boggy soil, like *Arethusa Bulbosa.*

IRIDĒÆ.

IRIS GLAUCA. *MSS.* Iris germanica. *Smith in Fl. Græc. v.* 1. *p.* 29. *t.* 40. Iris pallida. *Ker in Bot. Mag. n.* 685. *cum Ic.* Iris sambucina. *Linn. Sp. Pl. ed.* 2. *p.* 55. Iris dalmatica major. *Park. Pas. p.* 186. Iris major latifolia 11. sive Asiatica cærul. *Clus. His. Pl. tib.* 2. *p.* 218.

This plant, which grows wild abundantly in all Greece, is rather tender, and should be cultivated here in a light soil,

on a dry bottom. It may be forced, and brought to flower as early as January, if planted in a pretty large pot, plunged in the bark-bed.

Iris Fragrans. *MSS.* Iris subbiflora. *Ker in Bot. Mag. n.* 1130. *cum Ic.*—*Broter. Fl. Lus. v.* 1. *p.* 56. Iris latifolia major xxii. *Clus. Hist. Pl. lib.* 2. *p.* 222. Iris biflora *&c. Lob. Ic. t.* 68. *f.* 2.

I found this most fragrant species well established in the garden at Mill Hill, where it flowered every year. It grows wild, near Lisbon, in chalky soil. The name of *Subbiflora* is very inappropriate, for it commonly produces only one flower, and the old writers by *Biflora* meant, that it flowered in autumn as well as spring, which it sometimes does.

Evansia Chinensis. *MSS.* Iris fimbriata. *Decand. in Pl. Lil. v.* 3. *n.* 152. *cum Ic.*—*Vent. Jard. Cels. n.* 9. *cum Ic.* Iris chinensis. *Curt. in Bot. Mag. n.* 373. *cum Ic.*

I believe that this plant constitutes a distinct genus, which I have named after Thomas Evans, Esq. of Stepney, who has introduced, besides it, so many other plants into this country. It will live in the open border, except in very severe winters; but is so ornamental, as to merit a place in every green-house.

Xiphium Sordidum. *MSS.* Iris lusitanica. *Ker in Bot. Mag. n.* 679. *cum Ic.* Iris sordida. *Soland. MSS.*

This species sports exceedingly in the colour of its flowers, some varieties of which are very beautiful; and it will succeed in any soil that is well drained.

Thelysia Grandiflora. *MSS.* Iris scorpioides. *Desf.*

Fl. Atl. v. 1. *p.* 40. *t.* 6. Iris microptera. *Lamarck Illust. n.* 571. Iris alata. *Lamarck in Encycl. Bot. v.* 3. *p.* 302.

I received bulbs of this rare plant, in 1801, from Sir Joseph Banks, which were sent to him by Professor Broussonet, from Mogadore; but though they lived, and even multiplied in the open air at Mill Hill, they never flowered after the first year. Desfontaines informs us, that it grows naturally in wet places. A very deep light loam would probably suit it best here.

Hermodactylus Tuberosus. *MSS.* Iris tuberosa. *Smith in Fl. Græcâ. v.* 1. *p.* 29. *t.* 41.—*Curt. in Bot. Mag. n.* 531. *cum Ic.*—*Linn. Sp. Pl. ed.* 2. *p.* 58. Hermodactylus folio quadrangulo. *Tournef. Cor. p.* 50.

Many gardeners have complained to me, that they cannnot make this plant flower; and I believe the directions given by Mr. Philip Miller, for its cultivation, are wrong: he says that "if the soil be light, it will be proper to put some rubbish at the bottom, to prevent the roots descending too deep, in which case they seldom produce flowers." It grows wild in the Peloponnesus: and in a border of deep rich loam, at Chapel-Allerton, flowered every year; at Mill Hill, on a dry gravel, it never flowered.

Diaphane Edulis. *MSS.* Moræa Sisyrinchium. *Ker in Bot. Mag. n.* 1407. *cum Ic.* Iris sisyrinchium. *Smith in Fl. Græc. v.* 1. *p.* 30. *t.* 42. — *Linn. Sp. Pl. ed.* 2. *p.* 59. Sisyrinchium majus. *Clus. Hist. Pl. lib.* 2. *p.* 216. *cum Ic.*

This plant, contrary to the last, will thrive on a gravelly soil; for I found it close to the green-house at Mill Hill,

where it certainly had been left by Mr. Peter Collinson: it will not however endure very severe frost; and as it succeeds well in a pot, may be sheltered under a common hot-bed frame. The young roots are eaten by children in Spain, and are not unlike a raw chestnut in flavour.

Diaphane Stylosa. *MSS.* Iris juncea. *Desf. Fl. Atl. v.* 1. *p.* 39. *t.* 4. Iris imberbis foliis junceis, &c. *Poir. It. v.* 2. *p.* 35.

Several bulbs of this species, gathered by Professor Broussonet, near Mogadore, in 1801, were given to me by Sir Joseph Banks, which flowered the following year; but none of those planted in the open ground lived, and those in pots dwindled away, becoming less and less every year, at last sending out only one or two fibres nearly as thick as the bulb itself. I suppose it requires a deep soil, with great extremes of drought and moisture, like many of the Cape plants.

Helixyra Flava. *MSS.* Moræa longiflora. *Ker in Bot. Mag. n.* 712. *cum Ic.*

This curious genus was introduced by George Hibbert, Esq. in 1802, from the Cape of Good Hope, where it grows wild. It should be cultivated here in a pot of light sandy loam, well drained by broken tiles, and fully exposed to the sun, after the leaves decay, till September: about the beginning of that month, every second or third year, the bulbs should be taken up and fresh potted, planting only from one to three bulbs in a pot, according to its size. In many collections, as soon as the bulbous exotics have flowered, the pots are removed into a back-shed, or even into the open air, under a north wall; and a practice so contrary to what nature indicates being very beneficial to the nurserymen, I fear some gardeners will still persist in it. Another

cause of failure in bulbous plants, sometimes arises from being greedy, and planting too many in the same pot.

Morea Barbigera. *MSS.* Moræa ciliata. γ *Ker in Bot. Mag. n.* 1012. *cum Ic.*

I cultivated this species many years, and it differs exceedingly from Mr. Ker's supposed varieties in its root, the coats of which are thicker, and more reticulated, like those of the true Cloth of Gold Crocus. I found it also more tender; and it grows wild in low sandy plains, near the sea, where the frost seldom reaches. If cultivated on the front flue or shelf of a stove, it will ripen seeds.

Morea Tricolor. *Kenn. in Bot. Rep. n.* 83. *cum Ic. bonâ.*

A tender species also, which should be kept very hot and dry after the leaves decay. It flowered abundantly last year, in Messrs. Lee and Kennedy's collection.

Morea Tristis. *Ker in Ann. Bot. v.* 1. *p.* 241. Iris tristis. *Ker in Bot. Mag. n.* 577. *cum Ic.* Moræa sordescens. *Jacq Ic. v.* 2. *t.* 225. — *Collect. Suppl. p.* 29. Moræa spatha, &c. *Ph. Mill. Ic. t.* 238. *f.* 1.

Mr. Philip Miller first named this plant after Robert More, Esq. a celebrated horticulturist in Shropshire. It is so hardy as to live through winter under a hot-bed frame, if matted up in very severe frost. It ripens seeds here abundantly, so might probably be naturalised in some of our sandy downs near the sea.

Morea Odora. *Par. Lond. n.* 10. *cum Ic.*

A charmingly fragrant species, which is now filling my library with perfume, like that of the Lily of the Valley. It is rather tender, and should be cultivated in pure sandy loam, exposing the pot to the full sun after the leaves decay. My

brother gardeners will, I trust, excuse a repetition of such injunctions respecting valuable plants, and this especially requires to have a long sound sleep, which can only be procured by contiued drought: an unseasonable shower has just the effect upon it, which a bucket of cold water, thrown over us when warm in bed at midnight, would have.

Dietes Iridifolia. *MSS.* Iris moræoides. *Ker in Bot. Mag. n.* 1407. *ad calcem descriptionis Morææ Sisyrinchii.* Moræa Iridioides. *Ker in Bot. Mag. n.* 693. *cum Ic.*—*Linn. Mant. p.* 28. Iris compressa. *Thunb. Diss. n.* 12. Moræa spatha, &c. *Ph. Mill. Ic. p.* 159. *t.* 239. *f.* 1.

For establishing this as a genus, I have the high authority of the late Mr. Dryander, who observed that its radication alone separated it from Moræa, as widely as its corolla does from Iris: in the last edition of the Hortus Kewensis, indeed, he has left it with Moræa, because he determined to follow Willdenow whenever he could. It is one of the hardier Cape plants, living through a mild winter here in the open air; and it is remarkable that the same peduncle continues flowering two or even three years together, with fruit hanging to it in different states of maturity. Whether this is the case in its natural climate, which is so much hotter than ours in summer, remains to be ascertained.

Homeria Collina. *Vent. Dec. Gen. Nov. p.* 5. Moræa collina. *Ker in Bot. Mag. n.* 1033. *cum Ic.* — *Jacq. Ic. rar. v.* 2. *t.* 220.—*Thunb. Diss. n.* 13. Sisyrinchium collinum. *Cav. Diss. n* 346.

Monsieur Ventenat, in my opinion, has very judiciously separated this genus from Moræa, several species of which flowered last summer in the collection of Messrs. Lee and

Kennedy. Their foreman, Mr. Cushing, tells me, that he mixes a little peat with the sand he plants them in: and I observed this species particularly luxuriant in such soil, having several flowers expanded at the same time.

Homeria Ochroleuca. *MSS.* Moræa collina. *γ Ker in Bot. Mag. n.* 1283. *cum Ic.*

This species flowered and ripened seeds at Chapel-Allerton in 1797, being among some bulbs given to me by Sir Joseph Banks: and it was there cultivated in pure white sand, such as I observed sticking among the coats of the root.

Marica Pantherina. *MSS.* Marica Northiana. *Ker in Bot. Mag. n.* 654. *cum Ic. bonâ.* Moræa vaginata. *Decand. in Pl. Lil. v.* 1. *n.* 56. *cum Ic.* Moræa Northiana. *Kenn. in Bot. Rep. n.* 255. *cum Ic.*

A most elegant plant, discovered wild by Sir Joseph Banks, in the small island of Raza, near Rio Janeiro. It was not introduced, however, till 1789, when the late Hon. Mrs. North received a plant of it, which had been sent to Lisbon. It delights in heat and moisture, ripening seeds in our stoves abundantly, if a little attention is paid to fecundate the stigma.

Trimeza Lurida. *MSS.* Iris Martinicensis. *Decand. in Pl. Lil. n.* 172. *cum Ic.*—*Curt. in Bot. Mag. n.* 416. *cum Ic.* —*Linn. Sp. Pl. ed.* 2. *p.* 52.

This grows wild in moist ground, and was in the collection of John Blackburne, Esq. at Orford, so long ago as 1776, from him I received seeds: they came up, and were cultivated very successfully without fire-heat, in a bark-pit which I used for Melons, before I had any stove.

Cipura Paludosa. *Aubl. Pl. Guian. v.* 1. *p.* 33. *t.* 13. Marica paludosa. *Ker in Bot. Mag. n.* 646. *cum Ic.*

A small bulb of this, purchased of Messrs. Lee and Kennedy, flowered all the summer of 1805 in a cucumber frame at Mill Hill, and ripened fruit; in which, as well as in its radication, it differs materially from both the preceding plants; but having neglected to examine its stigma, I am uncertain if it belongs to *Iridēæ*. The plant is tender, and should be constantly plunged in the bark-bed.

WITSENĒÆ.

Tigridia Grandiflora. *MSS.* Tigridia. *Juss. Gen. p.* 57. Ferraria Tigridia. *Sims in Bot. Mag. n.* 432. *cum Ic.* Ferraria pavonia. *Linn. Suppl. p.* 417. Moræa pavonia. *Thunb. Diss. n.* 20. Ocoloxochite seu colore tigris. *Hern. Hist. p.* 276. *cum Ic.*

I have planted bulbs of this splendid genus in various parts of the Isle of Wight: it grows wild about Mexico, and is perfectly hardy, thriving in any soil with a dry bottom. The seeds ripen in autumn, and come up round the mother-plant the following spring, if the surface of the border is not too much disturbed in weeding and digging. It may also be increased by the side bulbs, but they should not be kept long out of the ground.

Sisyrinchium Sertiflorum. *MSS.* Marica! Striata. *Ker in Bot. Mag. n.* 701. *cum Ic.* Moræa surtata. *Jacq. Hort. Schonbr. v.* 1. *p.* 6. *t.* 11. Sisyrinchium Spicatum. *Cav. Ic. v.* 2. *p.* 2. *t.* 104. Sisyrinchium striatum. *Smith Ic. Pict. n.* 9. *cum Ic.*

A native of Mexico, and quite hardy, flowering and ripening seeds abundantly every summer.

SISYRINCHIUM BERMUDIANUM. *MSS.* Sisyrinchium Iridioides. *Curt. in Bot. Mag. n.* 94. *cum Ic.* Sisyrinchium Bermudiana. *Linn. Sp. Pl. ed.* 2. *p.* 1353. Bermudiana Iridis folio, &c. *Dill. Hort. Elth. v.* 1. *p.* 48. *t.* 41. *f.* 48.

This plant is often lost in our gardens by being treated too hardily, though it will live through a mild winter in the open air: if the seeds are sown in the first hot-bed for tender annuals, plants from them will continue flowering all the autumn, till the frost destroys them.

HYDASTYLUS CALIFORNICUS. *MSS.* Marica Californica. *Ker in. Bot. Mag. n.* 983. *cum Ic.*

A perfectly hardy plant, I believe; at least many seedlings lived through the winter of 1806 in the open air at Mill Hill; and if sheltered under a cucumber frame, it may certainly be preserved, flowering and ripening seeds all summer. It comes nearer *Sisyrinchium* than any other genus, but differs too materially to be joined with it; and the name I have adopted was suggested by the late Mr. DRYANDER.

GALATEA VESPERTINA. *MSS.* Marica plicata. *Ker in Bot. Mag. n.* 655. *cum Ic.* Moræa palmifolia. *Jacq. Ic. v* 2. *t.* 227.—*Collect. v.* 3. *p.* 172. Sisyrinchium latifolium. *Soland. in Hort. Kew. v.* 3. *p.* 304. Bermudiana palmæfolio, &c. *Plum. Pl. Amer. p.* 35. *t.* 46. *f.* 2.

In many of our collections, this yet passes for Sisyrinchium Palmifolium of LINNÆUS, in which the peduncle is not cylindrical like that of our plant, but has two sharp edges. It grows wild on the western mountains of Jamaica; and is not very tender, thriving very well on the flue, or shelf of the stove. The flowers expand about sun-set, and are quite rolled up the next morning.

PATERSONIA SERICEA. *Brown Prodr. p.* 303.—*Ker in Bot. Mag. n.* 1041. *cum Ic.*

I received seeds of this beautiful species many years ago, which came up plentifully, but the plants all damped off in winter, though apparently well established.* Messrs. LEE and KENNEDY have been somewhat more successful; yet even they only preserved about half a dozen plants, and these likewise perished in the same way after flowering, without ripening seeds, or being increased; so that I believe it is no longer in the country. Probably it ought to be cultivated in pure sand, with a little more heat in winter.

NIVENIA STYLOSA. *MSS.* Nivenia. *Vent. Dec. Nov. Gen. p.* 3. Witsenia corymbosa. *Ker in Bot. Mag. n.* 895. *cum Ic.* —*Smith Ex. Bot. v.* 2. *p.* 17. *t.* 68.

A dwarf shrub, which now ornaments many collections with its lively blue flowers, every autumn. It was introduced from the Cape of Good Hope in 1803, by GEORGE HIBBERT, Esq. and has been named after his indefatigable collector, by the late Monsieur VENTENAT. Here it thrives best in a pot of sandy earth, exceedingly well drained; and it should be placed in an airy house, such as is proper for Aloes, during winter, when it requires very little water.

NIVENIA FILAMENTOSA. *MSS.*

A still more dwarf shrub than the preceding, but equally beautiful; introduced from the Cape of Good Hope in 1807, by Messrs. LEE and KENNEDY, in whose nursery it flowered, for the first time in this country, last August. The flowers are in a corymbus, precisely like that of *Nivenia Stylosa*, but

* A little powder of charcoal, obtained from Heath, or any other vegetable which does not contain calcareous earth, would possibly, in such cases, prove beneficial.—*Pres.*

differ, in having very long filaments, with a short style: and this species may at all times be distinguished by its leaves, which are not falcated, but almost perfectly straight at the point. It requires the same treatment as the preceding species.

Witsenia Tomentosa. *MSS.* Witsenia Maura. *Decand. in Pl. Lil. n.* 254. *cum Ic.*—*Thunb. Nov. Gen.* 2. *p.* 34. *cum Ic.*

Many young plants of this superb genus, raised from seeds brought by Mr. James Niven, are now thriving in Messrs. Lee and Kennedy's nursery. It grows wild on the mountains near False Bay; but so near the sea, that it is probably rather impatient of frost; and should be kept, during our winter, in an airy frame, well exposed to the sun.

Cleanthe Bicolor. *MSS.* Aristea melaleuca. *Ker in Bot. Mag. n.* 1277. *cum Ic.* Moræa melaleuca. *Thunb. Diss. n.* 1. *t.* 1. *f.* 3. Moræa lugens. *Linn. Suppl. p.* 990.

I received seeds of this rare plant from the Cape of Good Hope last year, which came up plentifully in my library window; and they differ exceedingly from those of Aristea, as well as the fruit itself. It flowered at Kew in 1788, and should be cultivated in pure sandy loam; two or three plants, which I potted in a richer compost, have already damped off.

Aristea Capitata. *Ker in Bot. Mag. n.* 605. *cum Ic.* Aristea major. *Kenn. in Bot. Rep. n.* 160. *cum Ic.* Moræa cærulea. *Thunb. Diss. n.*15. *t.* 2. *f.* 2. Ixia thyrsiflora. *De La Roche Diss. p.* 20.

This is a much more tender species than *Aristea Cyanea*, and requires more heat to make it flower; for it was cultivated five years at Mill Hill, where the summer temperature

is much cooler than in the valley of the Thames, without having flowered; but in a warm frame, or dry stove, it flowers when three, and sometimes when only two years old, ripening seeds abundantly.

Pardanthus Chinensis. *Ker in Ann. Bot. v.* 1. *p.* 247. Belamcanda Chinensis. *Decand. in Pl. Lil. n.* 121. *cum Ic.* Ixia Chinensis. *Curt. in Bot. Mag. n.* 171. *cum Ic.* — *Linn. Sp. Pl. ed.* 2. *p.* 52. Moræa Chinensis. *Thunb. Diss. n.* 19.

I am surprised not to see this fine exotic more frequently in our flower borders. Though it grows wild near Bombay, it most likely extends a great way towards the north, being so hardy as to endure the keenest frost of our climate. In a rich soil it becomes very luxuriant; and a root planted by me, two years ago, in some mud near St. Hellens, sent up stems last summer, which measured five feet eight inches in height.

Bobartia Juncea. *MSS.* Moræa spathacea. *Thunb. Diss. n.* 11. *t.* 1. *f.* 1.—*Linn. Suppl. p.* 99. Bobartia Indica. *Schumak. in Act. Hafn. v.* 3. *p.* 8. *t.* 11.—*Linn. Sp. Pl. ed.* 2. *p.* 78. Bobartia spicis, &c. *Linn. Fl. Zeyl. p.* 41.

This plant is found abundantly near Cape Town, where it is a great nuisance, obstructing the foot-paths by its long tough leaves. It flowers and ripens fruit all the year through, but has never been introduced here, to my knowledge, till last summer, when I met with it in Messrs. Middlemist's nursery. Being unquestionably a distinct genus, I am glad to restore the name given to it by Linnæus, in memory of that celebrated gardener, Mr. Jacob Bobart.

Hexaglottis Longifolia. *Vent. Dec. Nov. Gen. p.* 6.

Moræa flexuosa. *Ker in Bot. Mag. n.* 695. *cum Ic.* Ixia longifolia. *Jacq. Hort. Vind. v.* 3. *p.* 47. *t.* 90.

This plant flowered and ripened seeds very abundantly at Kew in 1786, and is hardy enough to live through winter under a hot-bed frame; but the root must be kept dry after the leaves decay.

Galaxia Grandiflora. *Kenn. in Bot Rep. n.* 164. *cum Ic.* Galaxia ovata *α. Ker in Bot. Mag. n.* 1208. *cum Ic.*

Few gardeners succeed in preserving the different species of *Galaxia*, more than one year after they are imported; for they only vegetate a few months, and require to be constantly exposed to the sun, without any rain, after their leaves decay. Anxious to understand the genus, I built a flue round a small hot-bed frame at Mill Hill, where I cultivated three of those now mentioned, during five years of my residence in that delightful village; and by fecundating the stigma, I obtained ripe seeds of this species, repeatedly. They were planted in one part of peat earth, mixed with two parts of sea sand, draining the pots, which were thirds, up to the middle with broken tiles. About the middle of November they were watered for the first time, and the soil kept just moist all winter, no fires having been made till after Christmas, and then only in very sharp frost. Towards the middle of February, as the leaves pushed, more water was given; and from that time a gentle fire was lighted every evening, which brought them into flower about the end of March, or beginning of April. In May, both fires and waterings were discontinued; but the frame was well closed up at night; and during the rest of summer they remained under the

glass, exposed to all the heat our sun would produce. At the end of September, the bulbs were examined and repotted, great care having been taken that the fresh soil was quite dry; for they push at this season with very little moisture indeed, and the later that can be deferred in our autumn the better.

GALAXIA OBTUSA. *MSS.* Galaxia ovata. *Kenn. in Bot. Rep. n.* 94. *cum Ic.*—*Jacq. Ic. v.* 2. *t.* 291. *fig. superior.*—*Thunb Nov. Gen.* 2. *p.* 51. *cum Ic.*

Introduced by GEORGE HIBBERT, Esq. in 1779, but soon after lost at Clapham; nor have I met with it in any collection since.

GALAXIA MUCRONULARIS. *MSS.* Galaxia ovata. *Jacq. Ic. v.* 2. *t.* 291. *fig. inferior ad sinistram.*

This flowered at Chapel-Allerton in 1797, being among a parcel of bulbs which had been given to me, the year before, by Sir JOSEPH BANKS.

GALAXIA VERSICOLOR. *MSS.* Galaxia ovata. *Jacq. Ic. v.* 2. *t.* 291. *fig. inferior ad dextram.*

In no genus can any species be more distinct than these two, which THUNBERG and JACQUIN make varieties: this flowers the earliest, and encreases plentifully by little bulbs, not formed at the root, but in the axils of the leaves.

GALAXIA GRAMINEA. *Ker in Bot. Mag. n.* 1292. *cum Ic.*—*Jacq. Collect. v.* 2. *p.* 366. *t.* 18. *f.* 2.—*Thunb. Nov. Gen.* 2. *p.* 51. *cum Ic.* Ixia fugacissima. *Linn. Suppl. p.* 94.

I purchased this, and the preceding species, of Messrs. LEE and KENNEDY, in 1800: it also forms bulbs, about the size and figure of an Oat, in the axils of the leaves; and I could not obtain seeds either of it, or of *Versicolor;* but from

a hint in one of our President's Papers,* it is probable that by taking away, or preventing the formation of these bulbs, the fruit might swell and ripen.

GLADIOLĒÆ.

Crocus Lagenæflorus. *Par. Lond. n.* 106. *cum Ic.* Crocus aureus. *Smith in Fl. Græc. p.* 25. *t.* 35. Crocus vernus luteus Mæsiacus flore aureo. *Park. Par. p.* 106. Crocus vernus Mæsiacus 1. *Clus. Pann. p.* 226.

Most Crocusses, especially this species, may be easily forced without any other nutriment than water, by placing the bulbs close to one another in small earthen pans not glazed. The sooner this is done in autumn the better; but it should not be later than the middle of September, giving only as much water to them every day, as will be dried up the next morning. Expose them fully to the air; and when you wish to hasten the blossoms, the pans must be removed into a hot-house, or south window of some warm room, where they can get every ray of sun that shines.

Trichonema Hypoxidiflorum. *MSS.* Trichonema caulescens. *Ker in Bot. Mag. n.* 1392. *cum Ic.*

I received this plant from the Cape of Good Hope in 1802, and it is so hardy as to live through winter under a hot-bed frame, only requiring shelter from severe frosts.

Trichonema Longifolium. *MSS.* Trichonema cruciatum. *Ker in Bot. Mag. n.* 575. *cum Ic.*

A more tender species than the preceding, and very distinct from Jacquin's *Cruciatum*, which Mr. Ker joins to it. All the Cape *Trichonemas* delight in pure sand mixed with a little

* See Horticultural Transactions, page 56.

peat, and should be kept very dry, after their leaves decay, till the end of autumn.

TRICHONEMA COLLINUM. *MSS.* Ixia bulbocodium. *Curt. in Bot. Mag. n. 265. cum Ic.* Crocus vernus angustifolius l. *Clus. Hist. Pl. Lib. 2. p. 207.*

In the Botanical Magazine, Mr. CURTIS gives excellent reasons for discontinuing such trivial names as *Melaleuca*, *Belladonna*, *Sisyrinchium*, and *Bulbocodium*, LINNÆUS having confounded under his *Ixia Bulbocodium*, all the species of *Trichonema* which grow wild in *Europe*. This is quite hardy, and, as he remarks, will succeed in almost any soil, not infested by vermin. I do not know if he here alludes to rats and mice; but they occasionally make great havoc among the bulbous roots of this Natural Order: it is therefore fortunate that a method of enticing and rendering these animals quite stupid, so as to be easily taken, is at last discovered, and will, I trust, through the patriotic efforts of our President, soon be made public.

HYALIS GRACILIS. *MSS.* Ixia capillaris *α. Ker in Bot. Mag. n. 57. cum Ic.* Ixia gracilis. *Prodr. p. 37.*

This species is hardy enough to live here, under a hot-bed frame without fire-heat, if well matted up in severe frost.

HYALIS LATIFOLIA. *MSS.* Ixia capillaris *β. Ker in Bot. Mag. n. 617 cum Ic. exclusis synonimis.*

A much more tender plant than the preceding, as are all the broad-leaved species, which I have yet met with. They should be cultivated like the *Galaxias*, draining the pots, with broken tiles, as well as with a few of the fibrous roots sifted out of the heaps of compost: this is a practice not new with many gardeners.

Hyalis Marginifolia. *MSS.* Ixia lancea. *Jacq. Ic. v.2. t.* 281.—*Collect. Suppl. p.* 13.

I never observed the leaves of this plant, during six years that it was in my collection, to lose their cartilaginous margin: but in seedlings, or very weak plants, the leaves are sometimes so narrow, as to be hardly distinguishable from those of a *Trichonema.*

Hyalis Aulica. *MSS.* Ixia aulica. *Dryand. in Hort. Kew. ed. 2. v. 1. p.* 66. Ixia capillaris *γ. Ker in Bot. Mag. n.* 1013. *cum Ic.*

This species was lost both at Kew and Clapham, soon after it was introduced, for want of more heat, I believe, in summer, and not winter. A single bulb only should be planted in each pot; for the fibres of one, that I saw turned out rotten, had formed a strong bag of net-work just the shape of the pot, like those of many *Watsonias.*

Hyalis Longiflora. *MSS.* Ixia longiflora. *Curt. in Bot. Mag. n.* 256. *cum Ic.* Gladiolus longiflorus. *Linn. Suppl. p.* 96.

I have a specimen of this plant gathered at Chelsea in the year 1758; and it will endure so much cold in winter, that by a little management, it might perhaps, with many other bulbs from the higher districts of the Cape, be cultivated in our borders, like Anemonies and Ranunculusses, not planting them till January or the beginning of February, as the weather might allow. If any one should make the experiment, it would not be adviseable to begin with bulbs fresh imported, but such as have been already here some years. This species increases most abundantly by sending out strings, which, like those of *Crocus Nudiflorus,* terminate in a bulb.

Tritonia Longiflora. *MSS.* Tritonia capensis. *Ker in Bot. Mag. n.* 618. *cum Ic. optimâ.*

A plant nearly allied to *Hyalis Longiflora*, and very possibly produced between it and the following species; it is, however, more tender than either of them.

Tritonia Catenularis. *MSS.* Tritonia lineata. *Dryand. in Ait. Hort. Kew. ed.* 2. *v.* 1. *p.* 91. Gladiolus Lineatus. *Curt. in Bot. Mag. n.* 487. *cum Ic. optimâ.*

This plant lived several years in the open air, close to a south wall, in Lord Petre's kitchen garden at Thorndon Hall, and differs from all its congeners yet discovered, in the old bulb not decaying annually: in a dry soil they will continue adhering, three and even four years. The *Gladiolus Lineatus* of my *Prodromus*, is a mere variety of *Tritonia Securigera.*

Sparaxis Grandiflora β. *Ker in Bot. Mag. n.* 541. *cum Ic.*

Several varieties of this beautiful species are in our gardens; and I succeeded in cultivating it in the open air at Mill Hill, planting the bulbs in January four or five inches deep, and covering the surface of the border with a little moss. From many experiments, I found it did not answer to keep them out of the ground later, not that the bulb seemed affected if kept dry, but its vegetation was advanced too rapidly, by the longer days and shorter nights: this appeared from two bulbs planted on the 20th of March 1804, one close to the green-house, facing the south, in front of which a large space, covered with gravel, reflected the sun's rays very strongly; and the other in the north court, where it had no sun after ten o'clock in the morning; this latter did not flower till the beginning of July, more than a month after

the other, but though not a larger bulb, it proved infinitely the stronger plant.

Ixia Pulchra. *MSS.* Ixia maculata *γ*. *Ker in Bot. Mag. n.* 549. *cum Ic.* Ixia maculata. *Kenn. in Bot. Rep. n.* 29 *cum Ic.*

In the *Botanical Magazine*, it is said that this species is not very tender: on the contrary, I have found that both this and several others nearly allied to it, require more nice attention on the part of the gardener, than any whatever in this vast genus. It will indeed exist, and even flower, if no frost reaches it; but to have it in full beauty, about three bulbs should be planted in a fourth sized pot of sandy soil mixed with a little peat, drained principally with sifted roots, and placed, after February, on the front shelf of a dry stove: with such treatment I have had the stems five feet high, and weighed down with flowers.

Ixia Serotina. *Prodr.* 35. Ixia erecta. *Ker in Bot. Mag. n.* 623. *cum Ic.* Ixia polystachia. *Linn. Sp. Pl. ed.* 2. *p.* 51. Ixia foliis, &c. *Ph. Mill. Ic. p.* 104. *t.* 155. *f.* 2.

This is certainly a more hardy species; and the name of *Serotina* was suggested by Mr. Francis Masson, who told me that it was one of the latest at the Cape

Dichone Crispa. *Laws. Cat. p.* 6. Ixia Crispa. *Ker in Bot. Mag. n.* 599. *cum Ic.* Ixia crispa. *Thunb. Diss n.* 8. *t.* 2. *f.* 3.

Few people have patience to cultivate this beautiful little plant, the largest bulbs of which are not much bigger than a Barley-corn. It will thrive in the south window of any warm room, endure the surface of the earth to be frozen, and as many as ten or a dozen bulbs may be planted together in a second-sized pot. A sandy soil, mixed with very little peat,

suits it best; but it must not have any water after the flower-stem appears,

HESPERANTHUS TENUIFOLIUS. *MSS.* Hesperantha radiata γ. *Ker in Bot. Mag. n.* 790. *cum Ic.*

A curious genus, the different species of which might be cultivated, with great profit, by our nurserymen, to ornament the midnight fêtes of this luxurious age; for, contrary to most others, their flowers are expanded, and diffuse a most fragrant smell all night. This is the most tender and delicate of any, requiring great care to preserve the root from much wet at all times; and it thrives best when treated like the *Galaxias*.

GISSORHIZA SECUNDA. *Dryand. in Hort. Kew. ed.* 2. *v.* 1. *p.* 83. Ixia secunda. *Ker in Bot. Mag. n.* 597. *cum Ic.*—*Jacq. Ic. v.* 2. *t.* 277. *Collect. v.* 4. *p.* 180. Ixia pusilla. *Kenn. in Bot. Rep. n.* 245.

This grows wild most abundantly in Roode Sand, at the Cape of Good Hope, the soil of which is so similar to that in some parts of Nottingham forest, that I could find no difference in a small parcel which, at my request, Mr. FRANCIS MASSON was so kind as to send here from that district. It is easily cultivated in such soil, and ripens seeds.

GISSORHIZA CILIARIS. *MSS.* Ixia ciliaris. *Prodr. p.* 36.

A very tender species, which I formerly multiplied, and gave to many collectors; yet few, except Mr. DONN, succeeded in preserving it. Although its leaves have a broad flat margin, they are delicate, and when broken the root is sure to suffer: they begin to decay a little before the flower-stem shoots up, and from that time no more water should be

given. It encreases slowly at the root, but ripens seeds abundantly, if the stigma is fecundated.

Rochea Venusta. *MSS.* Ixia Rochensis *α. Ker in Bot. Mag. n.* 598. *cum Ic.*

One of the most beautiful plants in this Natural Order, and not difficult to cultivate, if treated like the *Galaxias.* It encreases so slowly by offsets, that attention should be paid to fecundate the stigma, and obtain seeds. I have named the genus after Mr. De La Roche, who has written upon some of the plants allied to it.

Acaste Venusta. *MSS.* Ixia Rubro-cyanea. *Curt. in Bot. Mag. n.* 410. *cum Ic.* — *Jacq. Ic. v. 2. t.* 285. *Collect. v.* 3. *p.* 268.

Of this extensive genus I have cultivated at least thirty distinct species, all of which live and encrease with very little care; but to make them flower in perfection requires a good deal. Their bulbs, without exception, only send out three or four very strong fibres, which strike deep into the sand, and they should be planted in rather longer pots than usual, so near the top as to be hardly covered, cutting off the foot-stalks of the last year's leaves, which do not soon wither away, about half an inch long. During winter, and till the middle of February, let them vegetate as slowly as they can in our cold climate, giving plenty of air when there is no frost; but from that period they should have gradually more water and artificial heat, keeping the frame or house very hot after the equinox. This species, if so treated, often produces eight or nine flowers in a spike, and sometimes a side branch. The generic name, derived from the Greek verb *ακαζω*, *acuo*,

was suggested many years ago by my learned friend M. Correa de Serres, who first taught us all, that both regular and irregular flowers might occur upon the same spike, in some species of this genus.

Acaste Pulchra. *MSS.* Babiana! stricta α. *Ker in Bot. Mag. n.* 637. *cum. Ic.*

If this species is indulged with the front flue of a stove for about two months, it will flower and ripen seeds in great perfection: in a colder situation, sometimes, only one, or at most two, of its flowers expand.

Anomaza Excisa. *Laws. Cat. p.* 2. Gladiolus polystachius. *Kenn. in Bot. Rep. n.* 66. *cum Ic.* Anomatheca juncea. *Ker in Ann. Bot v.* 1. *p.* 227. Lapeyrousia juncea. *Ker in Bot. Mag. n.* 606. *cum Ic.* Ixia excisa. *Linn. Suppl. p.* 92.

I received bulbs of this plant from the Cape of Good Hope in 1789, an off-set from which, being afterwards sent by me to the Dowager Duchess of Portland, it was first figured from her Grace's plant, in the *Botanist's Repository*. It is so hardy as to live through a mild winter here in the open air, encreasing plentifully both by off-sets and seeds.

Watsonia Fulgida. *MSS.* Watsonia Iridifolia β. *Ker in Bot. Mag. n.* 600. *cum Ic.* Antholyza fulgens. *Kenn. in Bot. Rep. n.* 192. *cum Ic.*

All the taller species of this numerous genus require large pots, without which they seldom flower in perfection, and they must be deluged with water for two months before the peduncle shoots up, after which they require less, and none at all after their leaves are decayed. I suspect that many of them grow wild in situations which are under water in winter; and a little fresh loam, mixed with peat and sand, suits them

better than poorer soil. As they are exceedingly ornamental plants and none of them very tender, I wish some of our members would try them in front of their stoves, in the way Messrs. Malcolms cultivate many bulbs at Kensington.

Antholyza Floribunda. *MSS.* Antholyza Æthiopica. *Ker in Bot. Mag. n.* 561. *cum Ic.*—*Kenn. in Bot. Rep. n.* 210. *cum Ic.*

This beautiful plant has lived in the open air several years, near the front of the little hospital stove, in the royal gardens at Kew, where many of us saw it with both flowers, and frnit nearly ripe, on the same stalk, last June : it will not flower in a pot, unless that is very large ; and while the leaves are green, it should have plenty of water.

Antholyza Vittigera. *MSS.* Antholyza Æthiopica β. *Ker in Bot. Mag. n.* 1172. *cum Ic.* Antholyza ringens. *Kenn. in Bot. Rep. n.* 32. *cum Ic.* Gladiolus Æthiopicus. *Cornut. Pl. Can. p.* 78. *cum Ic.*

Three very distinct species, if not four, being confounded under the absurd name of *Æthiopica*, for they all grow wild at the Cape of Good Hope, it is best to get rid of it altogether. This is much more tender than the former, at least I could never make it flower but in the stove. The bulb of this species being very flat, the lower buds are placed apparently underneath it, the shoots from which come out of the earth almost horizontally. I first saw it thirty-four years ago, in the botanic garden of the Dowager Lady de Clifford, at King's Weston, near Bristol.

Petamenes Quadrangularis. *MSS.* Gladiolus Quadrangularis. *Ker in Bot. Mag. n.* 567. *cum Ic.* Gladiolus abbreviatus. *Kenn. in Bot. Rep. n.* 106. *cum Ic.*

A curious plant, and not difficult to cultivate, if treated like the other Cape plants it is allied to. The bulb sends out off-sets pretty freely, and should be kept very dry after the leaves decay.

Homoglossum Præcox. *MSS.* Gladiolus præcox. *Kenn. in Bot. Rep. n.* 38. *cum Ic.* Gladiolus Watsonius. *Curt. in Bot. Mag. n.* 450. *cum Ic.*—*Jacq. Ic. v.* 2. *t.* 233.—*Collect. v.* 3. *p.* 257.

This plant delights in sandy soil, and in rather more warmth than a common green-house affords, though it is not easily killed by cold: the pot however must be particularly well drained, for it grows wild on the sides of mountains near Constantia, which are burnt up in summer. Mr. Curtis justly remarks, that it is more nearly allied to *Antholyza* than to *Gladiolus*.

Gladiolus Concolor. *Par. Lond. n.* 8. *cum Ic.* Gladiolus tristis *β*. *Ker in Bot. Mag. n.* 1098. *cum Ic.*

Several species of *Gladiolus* allied to this, expand their flowers, and diffuse a fragrant smell, like those of *Hesperanthus*, during the night: many of them encrease likewise by innumerable little bulbs, formed in clusters very near the base where the fibres issue. I suspect that these little bulbs, of which I counted one hundred and sixty under a single root of this species, are deposited by a superabundance of returning sap, generated by the leaf: for I found only about half a dozen under a root, the leaves of which Mr. Charles Greville was so good as to allow me to cut off, soon after they were formed.

Gladiolus Cardinalis. *Curt. in Bot. Mag. n.* 135. *cum Ic.*

I believe that this fine plant will succeed much better in

the open border under any warm wall than in a pot; for it has lived one winter in my court, which is not a favourable situation: and in a pot it requires a great deal of water, till the leaves decay.

XYRIDĒÆ.

XYRIS OPERCULATA. *Ker in Bot. Mag. n.* 1158. *cum Ic.* —*Labill. Nov. Holl. v.* 1. *p.* 14. *t.* 10.

A more curious than beautiful plant, introduced by Mr. CONRAD LODDIGES in 1806. It grows wild in the Island of Van Diemen, and might, perhaps, therefore, succeed here in the open ground. Another species belonging to this Natural Order, with a curved trilocular capsule, splitting quite up to the top, was raised at Chapel-Allerton, from seeds gathered in some of the South Sea Islands, by Captain EDWARD EDWARDS; but being absent in London when it flowered, I could not describe it: and I have seen a third species, with ensate leaves, in Mr. WOODFORD's collection, from the Island of Trinidad.

HÆMODORĒÆ.

WACHENDORFIA BREVIFOLIA. *Ker in Bot. Mag. n.* 1116. *cum Ic.*

This species was introduced, in 1786, by Sir BROOKE BOOTHBY, in whose collection, near Lichfield, it both flowered and ripened seeds. It grows wild at the Cape of Good Hope, and should be treated here like the *Galaxias*, for though the root is not strictly bulbous, it will not bear much wet after the leaves decay.

XIPHIDIUM ALBUM. *Willd. Sp. Pl. v.* 1. *p.* 248. Xiphidium

floribundum α. *Swartz. Fl. Ind. Occ. v.* 1. *p.* 8. *t.* 2. *pessimâ.* Ixia Xiphidium. *Loefl. Res. p.* 179.

One of the most tender plants in our stoves, formerly cultivated by our worthy member, Mr. HOY, at Sion House. It grows wild at the foot of the mountains in St. Kitt's, and is easily propagated by its decumbent branches; but without being kept in very brisk heat, the flowers seldom appear here till Christmas, when most of them drop off without expanding. Those who wish to see them in perfection, therefore, must force the plant in spring, taking away all the smaller branches after July, and in September remove it into a low bark-pit, where it may almost touch the glass, and be as hot as possible: in this way I obtained ripe capsules. A shallow pan, about a foot and a half diameter, such as the nurserymen use for striking cuttings, suits it better than a common pot; and it delights in sandy soil mixed with decayed leaves.

GYROTHECA TINCTORIA. *MSS.* Heritiera Gmelini. *Michaux Fl. Bor. Amer. v.* 1. *p.* 21. Heritiera tinctorum. *Michaux in Bull. des Sciences. n.* 19.

A beautiful exotic from the swamps of South Carolina, introduced by Mr. FRASER, in 1788. I saw it flowering in his stove the following summer, though half dead for want of water, and he soon lost it by such neglect. The anthers are rolled back as in *Philydrum.*

ANIGOSIA FLAVIDA. *MSS.* Anigozanthus Flavida. *Ker in Bot. Mag. n.* 1151. *cum Ic.*—*Decand. in Pl. Lil. v.* 2. *n.* 176. *cum Ic.* Anigozanthus grandiflora. *Par. Lond. n.* 97. *cum Ic.*

This singular genus was raised at Kew, in 1803, from seeds collected on the south coast of New Holland, by Mr. PETER

Good, a botanic gardener, of whose merit the great number of valuable plants from that country, now in his Majesty's garden, are a sufficient testimony. It may possibly grow wild still more to the south, in the Island of Van Dieman, having ripened seeds with us, and lived through winter in the open air, near East Cowes, where I planted it two years ago.

VERATRĒÆ.

Aletris Farinosa. *Ker in Bot. Mag. n.* 1418. *cum Ic.* Wurmbea bullata. *Willd. Hort. Ber. n.* 8. *cum Ic.*

One of the most difficult plants to preserve here for any length of time, that I know: at Bulstrode, however, it lived and flowered several years, in a border of peat earth, mixed with sand, under the shade of *Azaleas* and *Rhododendrons.*

Lloydia Alpina. *MSS.* Anthericum serotinum. *Smith in Engl. Bot. n.* 793. *cum Ic.* — *Linn. Sp. Pl. ed.* 2. *p.* 444. Bulbosa alpina juncifolia, &c. *Ray Syn. ed.* 3. *p.* 374. *t.* 17. *f.* 1.

A very rare British plant, which, I have no doubt, might be cultivated in a border of peat earth, kept constantly moist, and shaded by pales or a wall, not under trees or shrubs; for Dr. William Alexander, of Halifax, who, like Sir Thomas Gage, was near losing his life in climbing to the dangerous summits where it grows wild, preserved it many years in his garden. I sacrificed a plant given to me, by the former of those friends, in examining the root, which is not bulbous, but most faithfully represented by Mr. Sowerby, in his excellent figure above quoted. As it constitutes a distinct genus, I have named it after the celebrated Edward Llhwyd, Esq. who communicated so many scarce plants to

Ray, and was the author of the catalogue of Welsh plants in Bishop Gibson's edition of Camden's Britannia.

Zigadenus Glaberrimus. *Michaux Fl. Bot. Amer. v.* 1. *p.* 214. *t.* 22.

I have a specimen of this plant, gathered at Kew, about seven or eight years ago, and which I then, like Mr. Aiton, supposed to be a *Melanthium*, but am now convinced that Richard, who assisted Michaux in the work above quoted, has separated it from that genus with great propriety. I saw it last summer again in Mr. Fraser's nursery. It will probably thrive in any moist border of sandy peat.

BULBOCODĒÆ.

Colchicum Floribundum. *Laws. Cat. p.* 6. Colchicum Byzantinum. ***Ker in Bot. Mag. n.*** 1122. *cum Ic.* Colchicum latifolium byzantinum, &c. *Clus. Hist. Pl. Lib.* 2. *p.* 199.

A most valuable plant, as it will grow in any soil, and in deep loam continue flowering five or six weeks. If I am not mistaken, we have now in our gardens five distinct species of this genus, and they endure the smoke of London, as well as Lilies and Auriculas.

UVULARĒÆ.

Cymbanthes Fœtida. *MSS.* Melanthium eucomoides. *Ker in Bot. Mag. n.* 641. *cum Ic.* — *Jacq. Ic. v.* 2. *t.* 452.— *Collect. Suppl. p.* 104.

The plants from the Cape of Good Hope, hitherto referred to *Melanthium*, differ so exceedingly from that genus, that I place them even in a separate order. This is quite hardy, and will thrive much better in the open ground under a

south wall, where it can remain dry during summer, than in a pot. As the new bulb, formed annually, rises considerably above the old one, it should be planted deep, and a sandy loam suits it best.

WURMBEA PURPUREA. *Dryand. in Hort. Kew. ed. 2. v. 2. p.* 326. Melanthium spicatum. *Ker in Bot. Mag. n.* 694. *cum Ic.*

I have never been able to preserve this species under a common frame: but it succeeds very well if treated like the *Galaxias*, and on the flue of a stove will ripen seeds plentifully.

BÆOMETRA COLUMELLARIS. *MSS.* Melanthium Uniflorum. *Ker in Bot. Mag. n.* 767. *cum Ic.*—*Jacq. Ic. v. 2. t.* 450. —*Collect. v.* 4. *p.* 100. Tulipa Breyniana. *Linn. Sp. Pl. ed.* 2. *p.* 438.

This is not a tender plant, but it will flower much more luxuriantly, and ripen seeds with a little artificial heat.

ORNITHOGLOSSUM GLAUCUM. *Par. Lond. n.* 54. *cum Ic.* Melanthium viride. *Ker in Bot. Mag. n.* 994. *cum Ic.*—*Kenn. in Bot. Rep. n.* 233. *cum Ic.* Ornithoglossum viride. *Brown in Hort. Kew. ed. 2. v. 2. p.* 327.

The leaves and even flowers of this plant are of a beautiful glaucous colour, not green. I suspect that it grows wild in situations flooded during winter; for a bulb, which by accident was planted in a large pot, and kept very moist on the flue of the stove at the Dowager Lady DE CLIFFORD's, sent up a stem with twenty flowers, and ripened seeds abundantly.

DIPIDAX ROSEA. *Laws. Cat. p.* 8. Melanthium junceum. *Ker in Bot. Mag. n.* 558. *cum Ic.*

This certainly grows wild in moist places at the Cape of

Good Hope, as appears by the ticket of a specimen which Mr. JAMES NIVEN sent to Messrs. LEE and KENNEDY. It thrives best here when indulged with a situation warmer than a common green-house.

ERYTHRONIUM AQUATILE. *MSS.* Erythronium Americanum. *Ker in Bot. Mag. n.* 1113. *cum Ic.* Erythronium Dens canis. *Michaux Fl. Bor. Amer. v.* 8. *p.* 198. Dens canis aquatilis, &c. *Clayt. in Fl. Virg t.* 2. *p.* 81.

I cultivated this plant thirty years without ever seeing its flowers, though the roots encreased in profusion, but producing a single leaf only. From CLAYTON's name of *Aquatilis*, it probably requires a very moist situation.

METHONICA GLORIOSA. *MSS.* Gloriosa Simplex. *Linn. Mant. p.* 62.

The Linnean name of this species originated in an error, for its leaves terminate in a clasper, like those of *Superba:* but it differs exceedingly in its petals, which are not undulated. It was introduced by Mr. PHILIP MILLER, in 1756, who received seeds of it, brought from Senegal, by the celebrated ADANSON: the plants at Chelsea, however, most probably died without flowering. It was next cultivated here by the Earl of TANKERVILLE, and flowered in his stove about 1782, since which time I have raised it from seeds, collected at Sierra Leone, and my plants also flowered. It thrives best if constantly kept in a pine-stove. In autumn after the stem decays, the root should be fresh potted, and have no water till it vegetates again in February or March.

DISPORUM PULLUM. *MSS.* Uvularia Chinensis. *Ker in Bot. Mag. n.* 916. *cum Ic.*

Mr. Brown has very justly observed, in his *Prodromus*, that this plant is not a *Uvularia;* and I had prepared a generic character and description of it for the *Paradisus Londinensis*, when Mr. Sydenham Edwards's excellent figure, in the *Botanical Magazine*, rendered another unnecessary. It is easily cultivated, and will probably succeed in the open ground.

ALSTROEMERĒÆ.

Vandesia Edulis. *MSS.* Alstroemeria Edulis. *Lambert in Bot. Rep. n.* 649. *cum Ic.—Tussac. Fl. Ant. p.* 109. *t.* 14.

I have named this genus, which contains many species, after Madame La Comtesse de Vandes, whose collection of rare exotics, near Bayswater, is so liberally open to botanists. The *Vandesia Edulis* flowered and ripened seeds in her stove, for the first time in England last year; having been sent to Thomas Evans, Esq. from the Botanic garden in the Island of St. Vincent, in 1806. Monsieur de Tussac tells us, that he discovered it in shady places of the mountains near Cape François, in the Island ot St. Domingo, where the inhabitants eat the globular tubers which terminate the fibres of its root, boiling them, as we do potatoes. I am not certain, however, that any of these tubers will produce a plant, for they resemble those of many *Pelargoniums*, and have no buds upon them; but by dividing the branches of the root above the tubers, where there is a bud, as in *Alstroemeria*, it may certainly be increased. Each root should be planted in a pot of light rich earth plunged in front of the bark-bed, where the stems, which arise in succession, must be suffered to wind

round some support; and when the plant is vigorous, it will continue flowering here from September till the middle of November. The best time to shift, or part the roots, is in April; and to make sure of seeds, the stigma, when fully expanded, must be fecundated by the pollen of a later blown flower.

LILĒÆ.

Lilium Monadelphum. *Ker in Bot. Mag. n.* 1405. *cum Ic.* — *Bieberst. Fl. Taur. v.* 1. *p.* 267. Lilium orientale latifolium flore luteo maximo odoratissimo. *Tournef. Cor.* 1. 25.

A native of the mountains of Caucasus, from whence its seeds were received, and plants raised, by Messrs. Loddiges, in 1804. It will thrive in almost any soil.

Lilium Tigrinum. *Dryand. in Hort. Kew. ed.* 2. *v.* 2. *p.* 241.—*Ker in Bot. Mag. n.* 1237. *cum Ic.* Lilium speciosum. *Jacks. in Bot. Rep. n.* 586. *cum Ic.* Kentan, &c. *Kæmpf. Amæn. Exot. p.* 871.

There is hardly a doubt, that this splendid species will succeed, in the most smoaky courts of our metropolis. It grows wild in China, from whence it was introduced, in 1804, by Captain Kirkpatrick; and, through the care and liberality of Mr. Aiton, at least ten thousand plants of it are already spread over the kingdom. A bulb is formed in the axil of almost every leaf; and these bulbs, in two years, become strong enough to flower.

Lilium Concolor. *Par. Lond. n.* 47. *cum Ic.*—*Ker in Bot. Mag. n.* 1655. *cum Ic.*

Introduced in 1804, from China, by the Right Hon.

Charles Greville, and will thrive better in the open ground than in a pot; for it produced six flowers upon a stem in my court, last summer.

Fritillaria Obliqua. *Ker in Bot. Mag. n.* 857. *cum Ic.*

A most rare species, which grows wild in the northern mountains of Caucasus, and on the banks of the Volga. I have not seen it any where, except in Mr. Williams s nursery at Turnham Green, who introduced it from Holland in 1802, and cultivated it in very sandy loam.

Tulipa Clusiana. *Ker in. Bot. Mag. n.* 1390. *cum Ic.* —*Decand. in Pl. Lil. n.* 37. *et.* 165. *cum Ic.* Tulipa persica præcox. *Clus. Cur. Post. p.* 9.

Introduced in 1810 by our worthy member Mr. George Anderson, who imported the bulbs from the Island of Sicily, where it probably grows wild. It is quite hardy.

HEMEROCALLIDĒÆ.

Yucca Recurvifolia. *Par. Lond. n.* 31. *cum Ic.*

I have only met with one plant of this species, which is in the garden of the late Mr. Swainson, at Twickenham, and was purchased of Mr. John Cree, many years ago. It is hardy, thriving with the same treatment as the *Yucca Gloriosa*, from which it may be distinguished, when not in flower, by its more recurved green leaves.

Hemerocallis Graminea. *Ker in Bot. Mag. n.* 873. *cum Ic.* —*Kenn. in Bot. Rep. n.* 244. *cum Ic.* Lilio-asphodelus luteus minor. *Mill. Gard. Dict. ed.* 1. *v.* 2. *n.* 2.

In the *Botanical Magazine*, this species is supposed to have been cultivated by Parkinson, and his *Paradisus* even

quoted for it, though he makes no mention of it whatever. I believe it was not introduced till 1734, when Dr. Richardson, of North Bierly, raised seeds of it, sent to him from Russia, and presented a plant to Mr. Philip Miller. It may be forced into blossom very early by being kept perfectly dry for two months before it is removed into heat.

Niobe Cordifolia. *MSS.* Hemerocallis Japonica. *Ker in Bot. Mag. n.* 1433. *cum Ic.* Hemerocallis alba. *Kenn. in Bot. Rep. n.* 194. *cum Ic.*

I dare not quote Thunberg's *Hemerocallis japonica* for this plant, as he describes the tube very short, "*unguicularis.*" It was introduced in 1790 from China, by George Hibbert, Esq., and though quite hardy, the flowers appear so late, as to be often cut off by our autumnal frosts, if it be not planted in a very warm situation. It probably grows wild in moist places, for I have seen it represented, on a Chinese paper, close to the edge of a pond.

Bryocles Ventricosa. *MSS.* Hemerocallis cærulea. *Ker in Bot. Mag. n.* 894. *cum Ic.*—*Vent. Hort. Malm. n.* 18. *cum Ic.*—*Kenn. in Bot. Rep. n.* 194. *cum Ic.*

A very hardy plant, introduced with the preceding from China, by George Hibbert, Esq. flowering here all summer, and ripening seeds abundantly. It differs too much from Niobe in the insertion of its filaments, besides other characters, to be joined to that genus; and they both differ exceedingly from *Hemerocallis*, in their seeds, as well as inflorescence.

Blandfordia Nobilis. *Brown Prodr. p.* 296.—*Smith Ex. Bot. v.* 1. *p.* 5. *t.* 4.

This species flowered in the collection of Godfrey Wentworth, Esq. at Hickleton, many years ago before I left Yorkshire. In a living flower brought to me by his gardener, the colours were not so bright as in the figure of the *Exotic Botany*, its lower side more curved, and the filaments curved towards the lower side; but though Dr. Smith describes the corolla as straight, and Mr. Brown does not mention this irregularity, yet upon comparing the flower, which I preserved, with specimens in Sir Joseph Banks's herbarium, I can find no difference. As this species grows wild plentifully near Port Jackson, it is extraordinary that it has not yet been seen in the gardens about London.

AGAVĒÆ.

Doryanthes Excelsa. *Correa in Linn. Trans. v. 6. p. 213. t. 23. 24.*

One of the most splendid plants we have yet received from New Holland. It will live in a green-house and possibly in the open ground near the sea; but vegetates so slowly, that I have recommended all my friends to give it more warmth; for, like the *Agaves*, it does not flower till it has made a considerable number of leaves. It should have light rich soil in a pot exceedingly well drained; several young plants of it having lately been rotted, by having been kept too wet.

NARCISSĒÆ.

Almyra Stellaris. *MSS.* Pancratium Illyricum. *Ker in Bot. Mag. n.* 718. *cum Ic.* — *Decand. in Pl. Lil. n.* 153. *cum Ic.* Pancratium Stellare. *Linn. Trans. v. 2. p.* 74. *t.* 14. —*Linn. Sp. Pl. ed. 2. p.* 418. Pancratium Spatha, &c. *Ph.*

Mill. Ic. v. 2. p. 32. t. 97. Lilio Narcissus Hemerocallidis facie. *Clus. Pl. lib. 2. p. 167. cum Ic.*

A maritime plant, which will nevertheless succeed in most other soils exceedingly well, and in very cold situations in deed, if the bulb is planted deep. This may be accounted for by its remaining quite inactive during the whole winter, the leaves only appearing above ground from April to September. It certainly grows wild near Rochelle, as MORISON states, and where I also found plenty of it in 1786. The flowers are very fragrant; and as it makes off-sets slowly, the seeds, which are often perfected near London, should be sown immediately after they are ripe, in pots of sandy loam, and sheltered from frost till the first leaf appears, which will be about March or April following. At the end of the second year transplant the bulb into the borders, where they are to remain.

EURYCLES SYLVESTRIS. *MSS.* Pancratium Amboinense. *Ker in Bot. Mag. n.* 1419. *cum Ic.*—*Brown Prodr. p.* 248. Pancratium Nervifolium. *Par. Lond. n.* 84. *cum Ic.* Crinum Nervosum. *L'Herit. Sert. Angl. p.* 8. Narcissus Amboinensis, &c. *Comm. Hort. v.* 1. *p.* 77. *t.* 39. Cæpa Sylvestris. *Rumph. Herb. Amb. v.* 6. *p.* 160. *t.* 70. *f.* 1.

This is a tender plant, native of the Islands of Java and Amboyna, where it grows in shady woods: it should be kept dry after the leaves decay, especially when plunged in the bark-bed; it will succeed, however, upon the flue of the stove; and by fecundating the stigma in hot sunshine, seeds of it may be obtained here. It differs so materially from the following genus in the structure of its crown, that I

do not hesitate to separate it; but that part is not divided to the base even on its inner side, as Mr. Brown describes it, being quite entire there.

Hymenocallis Littoralis. *MSS.* Pancratium Littorale. *Jacq. Hort. Vind. v. 3. p.* 41. *t.* 75. *bonâ.*—*Jacq. Hist. Amer. p.* 99. *t.* 179. *f.* 94. Pancratium, foliis, &c. *Trew. Pl. Select. p.* 6. *t.* 27. *bonâ.*

The fruit of this genus differs exceedingly from that of *Pancratium*, in having only two seeds in each cell, which swell to a considerable size, like bulbs, and I have named it *Hymenocallis*, from the beautiful membrane which connects the filaments. By a manuscript note of Dr. Richardson's, in his copy of Trew's *Plantæ Selectæ*, it appears that this species was cultivated at North Bierly, in 1742; and that Thomas Hodgson, who had worked as a labourer in his garden, but was pressed for a sailor, and sent home wounded from the famous siege of Carthagena, brought back roots with him. It grows wild there most abundantly in the sandy shores: and if indulged with a large pot in our stoves, produces a truly magnificent bunch of flowers.

Hymenocallis Paludosa. *MSS.* Pancratium rotatum α. *Ker in Bot. Mag. n.* 1082. *cum Ic. bonâ.* Pancratium disciforme. *Decand. in Pl. Lil. n.* 155. *cum Ic. bonâ.* Pancratium mexicanum. *Michaux Fl. Bot. Amer. v.* 1. *p.* 188.

I cultivated this species at Mill Hill with great success, in a pot of light rich earth, under a common hot-bed frame. It grows wild in the swamps of South Carolina, and was introduced in 1800 by Mr. Fraser, from whom I purchased it.

Hymenocallis Lacera. *MSS.* Pancratium rotatum β.

Ker in Bot. Mag. n. 827. *cum Ic.* Pancratium carolinianum. *Linn. Sp. Pl. ed.* 2. *p.* 418. Lilio Narcissus Polianthus, flore albo. *Catesb. Hist. v.* 2. *App. p.* 5. *t.* 5. *pessimâ.*

Though a native also of South Carolina, where the frost is occasionally very severe, this species is more tender than the preceding, and will not thrive with us, out of a stove, or bark-pit. I have ventured to quote the last synonym on the authority of roots gathered in a bog, about fifty miles up the river from Savannah, by my faithful servant, ROBERT BAGSHAW; and possibly in the identical spot where CATESBY discovered his plant, which was near Palachucula, a deserted Indian town, so that it will be easily ascertained by the botanists of that country. Mr. KER suspects that the figure was drawn from a plant of *Pancratium Maritimum* in our gardens, which it certainly resembles so much, that I joined them in the second volume of the *Linnean Transactions*: but as CATESBY says in his preface, "in designing the plants, I always did them while fresh and just gathered;" and afterwards in his description, "the leaves are of a deep shining green, like those of *Lilio Narcissus flore luteo autumnalis minor*," this figure only proves him to have been a very bad draughtsman: many of his others are equally incorrect.

HYMENOCALLIS SESSILIS. Pancratium Amœnum. *Jacks. in Bot. Rep. n.* 556. *cum Ic. malâ.*—*Linn. Trans. v.* 2. *p.* 71. *t.* 10. Pancratium declinatum. *Jacq. Hort. Vind. v.* 3. *p.* 11. *t.* 10. Pancratium Americanum floribus niveis, &c. *Ph. Mill. Dict. ed.* 1. *v.* 2. *n.* 4. Narcissus totus albus, &c. *Sloane Hist. Jam. v.* 1. *p.* 244, *auctoritate ejus speciminis.* Narcissus Americanus, &c. *Commel. Hort. Amst. v.* 2. *v.* 178. *t.* 87. *bonâ.*

I may be reproached for changing my own name of this species, but that now adopted invariably distinguishes it from both the following. It was cultivated by Mr. PHILIP MILLER, at Chelsea, in 1730, who sent it to Dr. MILNER of Leeds, and my plant was an off-set from his, after it had been removed to Temple Newsham. It grows wild in rather moist places of the Island of Jamaica, and thrives on a shelf of the stove, if plentifully supplied with water.

HYMENOCALLIS FRAGRANS. *MSS.* Pancratium Fragrans *Linn. Trans. v. 2. p. 72. t. 11.* Pancratium foliis, &c. *Trew. Pl. Select. p. 6. t. 28.*

The bulbs of this species were sent to me first in 1782, from the Island of Barbadoes; but I have since learnt, that they were brought there from Surinam, where the plant grows wild. It is now very common in our stoves, and sometimes ripens seeds, encreasing likewise abundantly by off-sets.

HYMENOCALLIS SPECIOSA. *MSS.* Pancratium speciosum. *Decand. in Pl. Lil. n. 156. cum Ic.?—Ker in Bot. Mag. n. 1453. cum Ic. bonâ.—Linn. Trans. v. 2. p. 73. t. 12.—Linn. fil. MSS.* Narcissus totus albus latifolius, &c. *Mart. Dec. p. 27. cum Ic.* Pancratium Americanum foliis latissimis, &c. *Ph. Mill. Dict. ed. 1. v. 2. n. 5.*

I cannot positively ascertain where this species grows wild, but Mr. PHILIP MILLER says in the Bahama Islands. It was not in the Chelsea garden however for many years, nor in any other that I know of, except the late Marchioness of ROCKINGHAM's, from whom I received my plant. By taking great pains to fecundate the stigma, I obtained several of its bulbiform seeds every year, while I resided at Chapel Allerton,

which being given to my friends, it is now pretty common; though it produces off-sets very slowly. The figure in the *Botanical Magazine* gives a very just representation of its size and beauty, when cultivated, as it ought to be, in a large pot of rich earth kept pretty moist.

Hymenocallis Tubiflora. *MSS.*

This species thrives with the same treatment as the last, and grows wild in Guiana, from whence it was introduced by the captors of a French vessel, of whom his Majesty purchased it, in 1803. The leaves are so much pointed at the top as to be almost cuspidated, and the tube of the corolla is exceedingly long, with a very short crown.

Pancratium Maritimum. *Decand. in Pl. Lil. n.* 8. *cum Ic.—Linn. Trans. v.* 2. *p.* 70. *t.* 9.—*Cav. Ic. v.* 1. *p.* 41. *t.* 56. *pessimâ.* Pancratium Illyricum. *Forsk. Fl. p.* 209.—*Linn. Sp. Pl. ed.* 2. *p.* 418. Pseudo-narcissus marinus albus, Pancratium vulgo. *Park. Par. p.* 106. *cum Ic.* Hemerocallis valentina. *Clus. Hist. Pl. lib.* 2. *p.* 167. *cum Ic.*

I think this beautiful genus might be naturalized in our sandy shores; a bulb planted by me in the Isle of Wight, among *Chelidonium corniculatum*, and *Eryngium Maritimum*, with which I saw it growing wild below Montpellier, has now been thriving for two years; if, therefore, any one who "comes unto those yellow sands" discovers the fair exotic, I beseech him to spare and treat it with as much delicacy as Ferdinand, mindful of Prospero's injunction, did Miranda. Though the leaves continue vegetating through winter, it would perhaps succeed in a more inland situation, by being planted deep in sandy soil, and occasionally sprinkled

with salt water; for it grows so near the sea, as to be covered with spray in every storm.

PANCRATIUM VERECUNDUM. *Soland. in Hort. Kew. ed.* 1. *v. p.* 412. Catulli Pola. *Rheede. Hort. Mal. v.* 11. *p.* 79. *t.* 40. *pessimâ.*

On the late Mr. DRYANDER's suggestion, which I then dared not to oppose, I joined this species to *Pancratium Maritimum*, in the second volume of the *Linnean Transactions.* It is however exceedingly distinct, and flowered in Mr. WOODFORD's stove not long before he left Springwell. The soil sent along with it was black vegetable mould, and he believed that it came from the Island of Ceylon.

PANCRATIUM TIARÆFLORUM. *Par. Lond. n.* 86. *cum Ic.* Pancratium zeylanicum. *Linn. Sp. Pl. ed.* 2. *p.* 418. Narcissus zeylanicus, &c. *Commel. Hort. Amst. v.* 1. *p.* 75. *t.* 35. Narcissus zeylanicus flore albo 6-gono ordorato. *Herm. Hort. Lugd. p.* 691. *cum Ic.* Lilium indicum. *Rumph. Herb. Amb. v.* 6. *p.* 171. *t.* 70. *f.* 2.

This plant grows wild abundantly in the Island of Ceylon, also near Malacca, where it ornaments the sides of the roads with its fragrant flowers, during the month of November. Here it requires the constant heat of a stove, and to be planted in light rich earth, with which treatment it ripened seeds, last October, in the Dowager Lady DE CLIFFORD's collection.

ISMENE CRINIFOLIA. *MSS.* Pancratium Amancaes. *Ker in Bot. Mag. n.* 1224. *cum Ic.* Narcissus Amancaes. *Ruiz. et Pavon Fl. Per. v.* 3. *p.* 53. *t.* 283. *α.*

Introduced from Brasil in 1808 by Mr. BRANDT, and grows wild plentifully on the hills near Lima, if it is really

the same plant as RUIZ and PAVON's. Messrs. LEE and KENNEDY cultivate it in a pot of sandy loam, on the shelf of their stove, where it flowered in February and again in April last year. The crown is occasionally extended a little beyond the attachments of the filaments, as in Narcissus.

AJAX PYGMÆUS. *MSS.* Narcissus minor. *Brot. Fl. Lus. v.* 1. *p.* 549.—*Curt. in Bot. Mag. n.* 6. *cum Ic.*—*Linn. Sp. Pl. ed.* 2. *p.* 415. *auctoritate ejus speciminis.* Narcissus exiguus. *Prodr. p.* 220. Pseudo-narcissus Hispanicus luteus minimus. *Park. Par. p.* 105. Bulbocodium minus. *J. Bauh. Hist. Pl. v.* 2. *p.* 597. Narcissus Hyspanicus pumilius, &c. *Theatr. Fl. t.* 20. Narcissus totus luteus montanus minimus. *Besl. Hort. Eystt. Vern.* 3. *Ord. fol. f.* 2. Narcissus totus luteus Hispanicus pumilius. *Vallet. Jard. cum Ic.* Pseudo-narcissus minor, &c. *Clus. Hist. Pl. Lib.* 2. *p.* 165. Pseudo-narcissi genus admodum exile. *Clus. Stirp. Pann. p.* 194. *lin.* 2.

A hardy species, which has been cultivated here since the time of PARKINSON, thriving in almost any soil and situation. It grows wild, near lakes, among the high mountains of Gerez, in Portugal.

AJAX CUNEIFLORUS. *MSS.* Narcissus Pumilus. *Prodr. p.* 220. Pseudo-narcissus Hispanicus minor luteus. *Park. Par. p.* 105. Narcissus Hispanicus minor luteus amplo calice reflexis foliis luteis. *Theat. Fl. t.* 20. Narcissus Pumilus. *Pass. Hort. Hyem. p.* 8. *cum Ic.* Pseudo-narcissus minor luteus repens. *Besl. Hort. Eystt. Vern.* 3. *Ord. fol.* 5. *f.* 4.

This is a difficult species to preserve, except in pure loam, and had been lost in our gardens many years, till 1782, when Messrs. LEE and KENNEDY imported some hundreds of bulbs from Holland. A parcel of these, taken up when in

flower, and planted at random in various parts of the garden at Chapel Allerton, succeeded admirably; multiplying by off-sets, as well as ripening seeds every year: but all the roots brought from thence to Mill Hill gradually decayed, just in the way I had before, year after year, observed them to go off in Messrs. LEE and KENNEDY's nursery. I suspect it may be Narcissus Pseudo-narcissus of BROTERO, and that the plant requires shade.

AJAX LACINULARIS. *MSS.* Narcissus major *β. Ker in Bot. Mag. n.* 617 *cum Ic. absque foliis.* Narcissus Propinquus. *Prodr. p.* 221. Narcissus Hispanicus medius luteus. *Theatr. Fl. t.* 20. Pseudo-narcissus aureus præcox. *Besl. Hort. Eystt. Vern.* 3. *Ord. fol.* 6. *f.* 3.

I am not able to trace the first introduction of this species, but it was cultivated by Dr. RICHARDSON, at North Bierly, in 1712, in whose woods I gathered it with *Tulipa Sylvestris*, about forty years ago. It is often sent accidentally among Dutch bulbs, and will grow in any soil, though much bolder in damp loam.

AJAX GRANDIFLORUS. *MSS.* Narcissus Grandiflorus *Prodr. p.* 221. Narcissus major. *Curt. in Bot. Mag. n.* 51. *cum Ic. optimâ.* Narcissus Hispanicus. *Gouan. Obs. p.* 23. Narcissus major totus luteus, &c. *Rudb. Camp. Elys. lib.* 2. *p.* 71. *t.* 9. *bonâ.* Pseudo-narcissus aureus Hispanicus maximus. *Park. Par. p.* 99. Bulbocodium Hispanicum. *J. Bauh. Hist. Pl. v.* 2. *p.* 594. Narcissus totus luteus montanus, &c. *Besl. Hort. Eystt. Vern.* 3. *Ord. fol.* 1. *f.* 1. Narcissus totus luteus sylvestris major. *Vallet Jard. cum Ic.*

This species grows wild plentifully in the mountains of L'Esperou, and is a noble plant, rarely seen in perfection

near London; for it delights in a shady exposure, and deep rich loam. Two large beds of it, nevertheless, were very flourishing many years in the moist hollow of a nursery on the Kilburn road: and it used to be equally luxuriant in Mr. Curtis's botanic garden at Lambeth: but he complained to me that it did not thrive at all when removed to Brompton. I believe that few of these Alpine species will endure the drought and burning sun we often experience in June, especially when on a gravelly bottom. I have never seen them thrive so well in any garden as they did at Chapel Allerton, where the summer temperature is so low that Scarlet Strawberries seldom ripen before the beginning of July.

Ajax Obvallaris. *MSS.* Narcissus major γ. *Ker in Bot. Mag. n.* 1031. *cum Ic. absque foliis.* Narcissus Sibthorpii. *Haworth in Linn. Trans. v. 5. p.* 243. Narcissus Obvallaris. *Prodr. p.* 22. Pseudo-narcissus major Hispanic. *Clus. Hist. Pl. lib.* 2. *p.* 165.

The first time I saw this plant, it was pointed out to me by Mr. Curtis, as an indigenous species, which he had just received from Dr. John Sibthorp. To Oxford I set off the next day, where I was not a little disappointed to learn, that by a mistake of the gardener's, some bulbs of it, intended for Mr. Sole, had been directed to Mr. Curtis, and those of our wild species, which Mr. Curtis wished to have from Noke Woods, had been sent to Mr. Sole. By way of consolation, however, my late excellent friend loaded me with many plants not then in my garden, and we spent a whole morning in examining Sherrard's Herbarium: but no specimen of this plant was to be found, nor could he tell me any thing about it, except that when his father, who was then absent

in Lincolnshire, came to Oxford, it was called Bobart's Daffodil. This name alone is sufficient evidence, to my mind, of its having been introduced by one of the Bobarts, and probably by the younger; for it is not mentioned in the second edition of the *Catalogus Horti Oxoniensis* published in 1658. It used to ripen seeds at Chapel Allerton, and succeeds best in damp loam. If Clusius' synonym above quoted really belongs to this species, as I suspect, it grows wild in the wet meadows of Castilla La Vieja. Mr. Ker, indeed, in the 1301st number of the *Botanical Magazine*, has added that to his more cautious predecessor's synonyms of *Grandiflorus;* but Clusius expressly says, that the flower of his plant is less, and its leaves greener, than those of our indigenous Daffodil. This synonym accordingly must be determined by some botanist resident in Castilla La Vieja: for in our gardens *Grandiflorus* has not only a large flower, but the most glaucous leaves of any species yet known.

Ajax Lorifolius. *MSS.* Narcissus Bicolor. *Ker in Bot. Mag. n.* 1187. *cum Ic.* — *Haworth in Linn. Trans. v.* 5. *p.* 244.

For my knowledge of this species I was also indebted to Mr. Curtis, nor have I seen it any where except in the vicinity of London. He found it in an old garden at Lewisham, and it thrives in almost any soil that is not very dry.

Ajax Bicolor. *MSS.* Narcissus Tubæflorus. *Prodr. p.* 21. Narcissus Bicolor. *Gouan. Obs. Bot. p.* 22 — *Linn. Sp. Pl. v.* 2. *p.* 415. *auctoritate ejus speciminis.* Bulbocodium flore pallido tubo flavo serotinum. *Ray. Hist. Pl. v.* 2. *p.* 1130.

No figure has yet been published of this species, which

flowers after the others, rivalling, if not excelling, all its predecessors in grandeur and beauty. It is a truly alpine plant, with short broad leaves, encreasing fast in any soil, especially chalky loam, with some of which still adhering, bulbs were brought into this country from Montpellier, in 1781, by Broussonet. It had then however long been in the Oxford garden, and at Londesborough, in Yorkshire, to which it was sent from Sherard's celebrated garden at Eltham. Dr. Uvedale, one of the most eminent horticulturists of his time, gave it to Sherard, having received the roots from Magnol, in 1690, as appears by a manuscript catalogue of exotics in his garden at Enfield, chiefly bulbous plants, presented to me by my early and venerable friend, the son of Dr. Richardson. I do not think that it was introduced before that period, or known to Parkinson. Linnæus first mentions it in the second edition of the *Species Plantarum*: his specimen is from the Upsal garden, and the bulbs were sent to him by Barrere, a little before the death of the latter, as I was informed by Professor Gouan. The synonym of *Narcissus albus calyce flavo alter*, which both Linnæus and Gouan, misled by Casper Bauhin himself, quote for it, does not even belong to any species of this genus.

Ajax Festalis. *MSS.* *α.* Narcissus Pseudo-narcissus. *Shaw in Engl. Bot. n.* 17. *cum Ic.* Narcissus foliis, &c. *Hall. Hist. n.* 1252. Narcissus sylvestris, &c. *Ray. Syn. ed. 3. p.* 371. Bulbocodium vulgatius. *J. Bauh. Hist. Pl. v. 2. p.* 593. Pseudo-narcissus vulgaris. *Clus. Hist. Pl. lib. 2. p.* 164.—*β.* Narcissus serratus. *Haworth Diss. p.* 179.

Of these two varieties, in the former the crown is more finely crenated: and bulbs from Charlton flower at least a

fortnight earlier than those from Mill Hill, when planted close together: in the latter a strange difference of smell occurs, for among many flowers growing in the same field, which exhale the usual narcotic odour, some few will be found with a totally different and pleasant smell, like that of a *Polyanthus;* and this difference is permanent in the flowers of that bulb and its offspring. I have only met with such roots twice, near Kirkstall Abbey, in Yorkshire, and in a field behind the King's Head Inn, in Mill Hill; but in both places many flowers were slightly fragrant, and a very few powerfully so. Professor Gouan mentions a parallel difference of smell in the flowers of *Grandiflorus;* but that it rather resembled that of Lilac, and was often diffused after the flowers had been long blown: "Nectarium sæpe odoris expers, sæpius (et sub anthesis finem) odorem spirat suavissimum, Syringæ magis quam Narcisso affinem," are his words. In our Festalis, the fragrance is strongest when the crown is just beginning to open, and latterly somewhat of the Daffodil smell, mixed with the other, is perceptible. Probably with a little attention, such individuals may be found in both varieties all over the kingdom: the pleasant smell is no doubt diffused by the anthers, but the unpleasant one by the corolla: for those roots with sweet-smelling flowers, which I transplanted into my garden, always ripened seeds.

Ajax Patulus. *MSS.* Narcissus candidissimus. *Desf. in Pl. Lil. v. 4. n.* 188. *cum Ic.* Narcissus moschatus δ. *Ker in Bot. Mag. n.* 1300. *cum Ic. bonâ.* Narcissus albus. *Haworth in Linn. Trans. v.* 5. *p.* 243. Narcissus moschatus. *Linn. Sp. Pl. ed.* 2. *p.* 415. *auctoritate ejus speciminis.* Pseudo-narcissus flore albo minor. *Park. Par. p.* 1600. Narcissus sylvestris totus albus

amplo calyce. *Theatr. Fl. t.* 20. Pseudo-narcissus albo flore. *Clus. Auct. cum Ic.*

In the days of PARKINSON, this species was as common as it is now scarce, being mentioned by all the old botanists. It requires shade and pure loam, but will not refuse to live in other soils. The flowers have a slight citron-like perfume, and it is unquestionably the *Narcissus Moschatus* of LINNÆUS who was induced to give it that doubly erroneous name, partly by a blunder of CASPER BAUHIN.

AJAX LONGIFLORUS. *MSS.* Narcissus moschatus *α. Ker in Bot. Mag. n.* 924. *cum Ic. bond.* Narcissus cernuus. *Roth. Catalect. fasc.* 1. *p.* 43. Narcissus tortuosus.. *Haworth Diss. p.* 179. Narcissus albus calyce prælongo flore pendente. *Rudb. Camp. Elys. lib.* 2. *p.* 73. *f.* 16. Pseudo-narcissus Hispanicus flore albo medius. *Park. Par. p.* 100. Pseudo-narcissi flore albo varietas. *Clus. Cur. Port. p.* 14.

Both these milk-white *Daffodils* were cultivated at Paris, in the time of HENRY the FOURTH: and I saw at Fontainbleau, in 1786, a fire-screen, said to have been given by him to the fair GABRIELLE, on which they were most naturally embroidered in coloured silks, still fresh: they were represented growing out of the earth, with several flowers in each bunch, and the crown of this species straw-colour, which it is for a day or two: at the bottom was the following title and date, *Conquelourdes blancs*, 1598. The flowers of this species smell like Ginger, and it will grow in any soil, preferring, nevertheless, a moist loam. I found it in the field at Mill Hill, where the seeds ripened every year, but in the borders of the garden, which was nearer the gravel, very seldom.

CORBULARIA TENUIFOLIA. *MSS.* Narcissus tenuifolius

Haworth in Linn. Trans. v. 5. *p.* 243. — *Prodr. p.* 222. Bulbocodium tenuifolium aliud, &c. *J. Bauh. Hist. Pl. v.* 2. *p.* 596. Pseudo-narc. junceis foliis 11. *Clus. Hist. Pl. lib.* 2. *p.* 106.

This species grows wild in the mountains of Biscay, and though it may have been in our gardens formerly, I do not think that it was known to PARKINSON. I met with it at Mile End, where there was a whole bed thriving many years, the original bulbs having been imported from Holland in 1760, by Mr. JAMES GORDON; and he probably introduced it, for I never saw it in any other collection, till I had also encreased and distributed the bulbs among my friends. Mr. PHILIP MILLER takes no notice of it, nor have I yet found a specimen in any of our old herbariums. It is hardy, but should be planted in pure loam, and a very sheltered situation; for, as the leaves appear in autumn, they are sometimes cut off by hard black frosts, which injure the roots exceedingly. It flowers here in the end of February, or March.

CORBULARIA OBESA. *MSS.* Narcissus Bulbocodium. *Brot. Fl. Lus. v.* 1. *p.* 549. Narcissus lobulatus. *Haworth Diss. p.* 178. Narcissus inflatus. *Haworth in Linn. Trans. v.* 5. *p.* 243. Bulbocodium tenuifolium, flore luteo. *J. Bauh. Hist. Pl. v.* 2. *p.* 596. *cum Ic.* Pseudo-narcissus junceis foliis 1. *Clus. Hist. Pl. lib.* 2. *p.* 165.

A more tender species than the former; growing wild in various parts of Portugal and Spain, as well as in Tangier, from which last country BROUSSONET sent me both roots and specimens. It will exist here in the open ground, but the best method of cultivating it is in a pot of light hazel

loam, under a frame with alpine plants, as it only requires protection from severe frost. With this treatment it multiplied by off-sets abundantly, and often ripened seeds at Chapel Allerton.

Corbularia Turgida *MSS.* Narcissus Bulbocodium. *Decand. in Pl. Lil. n.* 24. *cum Ic. bonâ.—Curt. in Bot. Mag. n.* 88. *cum Ic.—Linn. Sp. Pl. ed.* 2. *p.* 417. *auctoritate ejus speciminis, nec non Cliffortiani.* Pseudo-narcissus juncifolius luteus serotinus. *Park. Par. p.* 106. Pseudo-narcissus Pyrenæus flore subluteo amplo calyce juncifolius. *Theatr. Fl. t.* 21.

This is a Pyrenæan mountain plant, which grows wild abundantly near Tarbes, quite hardy, and will thrive with us in any soil, flowering late in April or May. It is now brought forced to Covent Garden in great plenty every spring. Besides these three species, Mr. Haworth possesses a dried specimen of a fourth, the bulb of which came from Holland, with the title of *White Trompet Marin;* this I have not yet seen living, but it grows wild in Biscay, and was certainly cultivated by Parkinson in 1629.

Queltia Ampla. *MSS.* α. Narcissus maximus griseus calyce flavo. *Pass. Hort. Vern. t.* 22. Butter and Eggs, *nostratibus.—*β. Narcissus Gouani. *Decand. in Pl. Lil. v.* 4. *n.* 220. *cum Ic. ad exempl. siccum.—Roth. Catalect. fasc.* 2. *p.* 32. Narcissus Amplus. *Prodr. p.* 224. Narcissus Incomparabilis. *Curt. in Bot. Mag. n.* 121. *cum Ic.* Narcissus Odorus. *Gouan. Obs. p.* 23. *auctoritate ejus speciminis.—Linn. Amoen. v.* 4. *p.* 311. Narcissus latifolius, &c. sive Nonpareille. *Park. Par. p.* 68. Narcissus omnium maximus. *Pass. Hort. Vern. t.* 4.

optimâ. Narcissus latifolius flavo flore amplo calyce. *Clus. Cur. Post. p.* 60.

The first of these varieties is very common in all our gardens, in a double state, but I have never met with it single: the second produces flowers of a paler or deeper tint, according to the soil and situation in which it grows; for on dry lime-stone fully exposed to the sun, they are much yellower; and in a parcel of roots taken up with a ball of earth, to be transplanted from a shady situation, but accidentally left on a gravel walk, I found the crown two days after changed to a deep orange colour. It was discovered near Bagneres de Luchon, by NICHOLAS LE QUELT, so famed in ancient story as a rhizotomist, and will grow any where, but has never ripened seeds with us to my knowledge.

QUELTIA POCULIGERA. *MSS.* Narcissus Poculiformis. *Prodr. p.* 224. Narcissus totus albus maximus, calice mediocri serotinus. *Barrel. Pl. p.* 67. *t.* 948. Narcissus montanus sive Nonpareille totus albus, &c. *Park. Par. p.* 72. *cum Ic.* Narcissus oblongo calice. *Pass. Hort. Vern. t.* 20.

An elegant species, the flower of which is delightfully fragrant, like *Hyacinthus Muscari:* why that odour should have been compared to musk I am at a loss to conceive, being totally different. It grows wild in the Pyrenæan mountains, from whence bulbs were brought here by FRANCIS LE VEAU, whom PARKINSON eulogises as "the honestest root-gatherer that ever came over to us." TRADESCANT probably purchased some of these, in whose garden at Lambeth, fifty years afterwards, Dr. UVEDALE met with it, as appears by his catalogue. Dr. UVEDALE gave it to SHERARD, and from the Eltham garden it was lastly distributed to most others of

any note. I have seen it in Dr. Milner's garden at Leeds, at North Bierly, Londesborough, Badmington, the Oxford garden, and Mr. Peter Collinson's, Mill Hill. It should be planted in very deep moist loam, for in dry soils the flowers are generally small, imperfect, and torn.

Queltia Capax. *MSS.* Narcissus calathinus. *Decand. in Pl. Lil. n.* 177 *cum Ic. exclusis synonymis.*

This species flowered in the garden of Mr. Maddock, florist, at Walworth, about twenty years ago, who imported it from Holland; he had only a single root, which he would not part with at any price, and soon lost it, most probably owing to the rich composition of his borders. It grows wild in the Isles de Glenans, near Cape Finisterre; so we may hope, that notwithstanding the war, it may reach this country again.

Ganymedes Cernuus. *MSS.* Narcissus Cernuus. *Prodr. p.* 223. Narcissus Triandrus. *Curt. in Bot. Mag. n.* 48. *cum Ic.* Narcissus juncifolius flore pallido reflexe. *Ray. Hist. Pl. v.* 2. *p.* 1137.

I cannot quote *Narcissus triandrus* of Linnæus, taken up by him only from Clusius, as a synonym of this species, because both Clusius and Parkinson desribe the leaves of their plant green, and its flowers snow-white, characters of primary importance in this Natural Order: if they really are the same plant, which some future botanist who searches the mountains of Galicia must determine, Clusius has been less accurate than usual, and Parkinson has not only copied, but augmented that great botanist's blunder. It was introduced by Edward Whitaker Gray, M. D. in 1777, from Oporto, where it grows wild, and will endure the open air

here, for it even ripened seeds in the borders at Chapel Allerton. It succeeds better, nevertheless, in a pot of pure loam, sheltered under a frame, as in severe frosts, unless the ground is pretty well covered with snow the leaves are generally injured.

Ganymedes Effusus, *MSS.* Narcissus Trilobus! *Ker in Bot. Mag. n.* 945. *cum Ic.* Narcissus nutans. *Haworth Diss. p.* 179. Narcissus juncifolius calice luteo reflexis foliis albidis. *Park. Par. p.* 92.

To the florists in Holland we are indebted for preserving this species, from whence our nurserymen have lately imported it. It was cultivated by Parkinson, but had long been lost here, and thrives best, like the following, in the open ground.

Ganymedes Pulchellus, *MSS.* Narcissus Triandrus, *v.* luteus! *Ker in Bot. Mag. n.* 1262. *cum Ic.* Narcissus Pulchellus. *Prodr. p.* 223. Narcissus juncifolius calice albo reflexis foliis luteus. *Park. Par. p.* 92.

For many years this species was confined to the gardens about Halifax, in Yorkshire, where I helped to propagate it when at school in that neighbourhood, and was flogged in the Whitsuntide holidays, of 1769, for running out of bounds to know the name of it at North Bierly: lately, however, our worthy member, Mr. George Anderson, with the assistance of some London nurserymen, has pretty well cleared the north of it; and if they will only make it plentiful in the south I shall rejoice. The surest method of doing this, is to plant the bulbs in a border of pure loam, rather moist than dry; about once in four or five years, as soon as the leaves are decayed, they should be taken up and transplanted, but

not oftener ; for I have found this and many other bulbous-rooted plants, to succeed better by not being too frequently removed, their leaves sheltering one another in snows and storms, so that if the ends are cut, the lower part remains green. The figure in the *Botanical Magazine* is taken from a weak specimen, this species producing generally from three to five, and I have seen on a stem as many as seven flowers, the crown of which is very exactly divided into six small equal lobes.

Philogyne Conspicua. *MSS.* Narcissus Calathinus α. *Ker in Bot. Mag. n.* 934. *exclusis synonymis.* Narcissus odorus. *Decand. in Pl. Lil. n.* 157. *cum Ic.*—*Linn. Sp. Pl. ed.* 2. *p.* 416. *auctoritate ejus speciminis.* Narcissus elatior. *Haworth in Linn. Trans. v.* 5. *p.* 244. Narcissus lobatus. *Poiret. in Encycl. Bot. v.* 4. *p.* 247. Narcissus conspicuus. *Prodr. p.* 224. Narcissus juncifolius major amplo calice luteus præcox. *Theatr. Fl. t.* 22. *optimâ.*

This species is not described by Clusius or Parkinson, and the oldest specimen that I have seen in any herbarium, was gathered in the Eltham garden, in 1720, not long after it had been introduced by Dr. William Sherard : he probably sent, or brought it from some part of the Mediterranean coast, for it grows wild in the Island of Corsica, but is not indigenous, that I can ascertain, in the north of Spain. The first figure is in the *Theatrum Floræ* above quoted, which was published at Paris in 1622; but the plant had been lost there for more than a century, as Monsieur Thouin told me in 1786, and has only lately been again received in the Jardin des Plantes. In our country, by the liberal spirit of Mr. Thomas Knowlton, it is now very common, having been

abundantly increased by him, both before and after he left Eltham; among other gardens, he sent it to Dr. Richardson's as North Bierly, where I got my roots. It is a hardy plant, thriving in almost any soil, especially a deep hazel loam; but as the leaves appear above ground earlier than those of the two following species, they are often nipt at the end by very severe frosts

Philogyne Heminalis. Narcissus calathinus. *Delarb. Fl. p.* 138? Narcissus infundibulum. *Poiret. in Encycl. Bot. v.* 4. *p.* 427. Narcissus foliis junceis, &c. *Hall. Hist. v. 2. p.* 123? Narcissus juncifolius luteus magno calice. *Park. Par. p.* 92. *cum Ic.* Narcissus juncifolius minor amplo calice luteus. *Theatr. Fl. t.* 22. Narcissus juncifolius amplo calyce luteus. *Pass. Hort. Vern. p.* 23 *cum Ic.*

If the synonyms with a mark of interrogation belong to this species, it grows wild in the meadows of Mont D'Or, Orcival, and near the sources of the Dordogne, extending itself as far as Geneva: but my only authority for this guess is a specimen sent to me from Switzerland by Mr. Davall, nor am I sure of that being a wild one. It was cultivated both here and at Paris, early in the sixteenth century; and is now sometimes brought to Covent Garden in nosegays, mixed with the following, being equally hardy. No modern figure of it has yet been published.

Philogyne Calathina. *MSS.* Narcissus Lætus. *Prodr. p.* 322. Narcissus odorus. *Curt. in Bot. Mag. n.* 878. *cum Ic. bonâ.* Narcissus calathinus. *Linn. Sp. Pl. ed.* 2. *p.* 415. Narcissus trilobus. *Linn. Sp. Pl. ed.* 2. *p.* 417. *auctoritate ejus speciminis.* Narcissus angustifolius, sive juncifolius maximus amplo calice. *Park Par. p.* 90. *cum Ic.* Narcissus maximo calice

flore luteo. *Pass. Hort. Vern. p.* 24. *cum Ic.* Narcissus ix. qui angustifolius 1. *Clus. Hist. Pl. lib.* 2. *p.* 158.

This species grows wild in the north of Spain, from whence the roots were brought to me by Mr. Richard Ramsden Bramley, of Leeds, who went there to buy wool; and though it was already in my garden, they have ascertained its native country, and helped to confirm the last synonym: for L'Obel tells us, that Clusius' plant was discovered in the mountains near Compostella, by Nicholas Le Quelt. It is cultivated very abundantly by our market gardeners, and will thrive in most soils. As Linnæus took up his Narcissus calathinus without any specimen, from Clusius' synonym, I now adopt that name, and this plant is likewise the Narcissus trilobus of his herbarium.

Hermione Juncifolia. *MSS.* Narcissus Jonquilla. *Curt. in. Bot. Mag. n.* 15. *cum Ic.* — *Linn. Sp. Pl. ed.* 2. *p.* 417. Narcissus juncifolius luteus, vulgaris major. *Park. Par. p.* 94. Narcissus juncifolius luteus major calice brevi. *Theatr. Fl. t.* 22. Narcissus juncifolius major. *Pass. Hort. Vern. p.* 41. *cum Ic. bonâ.* Narcissus juncifolius luteus medius. *Valet. Jard. t.* 23. Narcissus x. qui juncifolius 1. *Clus. Hist. Pl. lib.* 2.*p.* 159. *cum Ic.*

The roots of this species are particularly subject to a disease, mentioned by Mr. Philip Miller in the earlier editions of his *Gardener's Dictionary*, for which I know no remedy; and as his account is scattered under a different plant, Crocus, and entirely omitted in Professor Martyn's edition, I shall here quote his words. "In the parish of Fulham the gardeners used to drive a great trade in the Double Jonquil, at which place these roots turned to as

great account for the master, as any crop they could employ their ground in, till within these seven or eight years; since which time most of their roots have turned *carroty*, and so proved barren, or produced only single flowers. To cure this disease, the method I used was to lay some tiles just under the roots, to prevent their running downwards; but this has not answered, nor do I think it possible wholly to recover them; for after this alteration in the root, the leaf which was fistulous becomes a plain sulcated leaf, and if the root ever blossoms after, the flowers are large and single, which were before small and double." This disease, I am sorry to add, is not confined either to the double or single Jonquil; and it may perhaps be occasioned by too little nutriment at one period, and too much at another; for I always observed more or less of it at Chapel Allerton in roots which remained accidentally in the green-house after being forced, and were watered, like the rest of that collection, more and more abundantly, as the days lengthened; the leaves of such forced roots often continuing green till August or September. I wish this hint may stimulate some active young gardener, to make the experiment of planting these diseased *carroty* roots in pure loam, and checking any growth in their leaves after the month of May, by covering the border when showers fall, so that it may be kept quite dry till the autumnal equinox.

Hermione Similis. *MSS.* Narcissus juncifolius luteus minor. *Park. Par. p.* 94. Narcissus juncifolius minor. *Pass. Hort. Vern. p.* 41. *cum Ic.*

I found this species very plentiful in the garden at Chapel Allerton, but when transplanted to Mill Hill, the roots

gradually decayed, and I have never seen it near London; the colour of the flowers is rather paler than in the Jonquil, and their smell somewhat different.

HERMIONE STELLARIS. *MSS.* Narcissus Bifrons α. *Ker in Bot. Mag. n.* 1186. *cum Ic.* Narcissus compressus. *Haworth in Linn. Trans. v. 5. p. 245.*

This species has probably originated in the Dutch gardens from the Jonquil, fecundated by some of the following, but it is not hybrid, having ripened seeds in Mr. GIBBS's nursery. It is occasionally imported from Holland, and thrives in moist loam.

HERMIONE BIFRONS. *MSS.* Narcissus Bifrons β. *Ker in Bot. Mag. n.* 1299. *cum Ic.* Narcissus tereticaulis. *Haworth in Linn. Trans. v. 5. p. 245. auctoritate ejus speciminis.*

I cultivated both this and the preceding plant for thirty years, without ever finding one change into the other, as Mr. KER relates. Its native country is unknown, being sent to us from Holland, and it may, like that, have been produced by the Dutch florists: neither of them are much valued, because they bear so few flowers, though excessively fragrant.

HERMIONE LEUCOIFOLIA. *MSS.* Narcissus orientalis α. *Ker in Bot. Mag. n.* 1298. *cum Ic. exclusis synonymis.*

The many species of this genus, confounded under *Narcissus Tazetta* of LINNÆUS, are so quickly sold at Covent Garden, that it is of some importance for a gardener to know those, which are hardy enough to succeed in the open ground. This will thrive any where, and forces admirably; but whether indigenous in the south of Europe, or an artificial production of some Dutch florist, is yet uncertain. I found it in the borders at Mill Hill, where it had increased prodigiously,

and often ripened seeds. Its green leaves, and peculiarly fragrant flowers, shew its near affinity to Bifrons.

HERMIONE STYLOSA. *MSS.* Narcissus Italicus. *Ker in Bot. Mag. n.* 1188. *cum Ic. bonâ.* Narcissus sulphureus major. *Park. Par. p.* 79

A tender species, hardly worth cultivating here; for its flowers have a sickly hue, as if they had been deprived of light, changing, as PARKINSON remarks, to "a more sullen yellow colour," and they come out later than most of the others, which is no recommendation in forcing. I believe it grows wild in the Island of Cyprus.

HERMIONE JASMINEA. *MSS.* Narcissus Papyraceus. *Ker in Bot. Mag. n.* 947. *cum Ic. exclusis synonymis præter antepenultimum.* Narcissus albus flore minore jasmine odore. *C. Bauh. Pin. p.* 50. Alius præterea, &c. fragrantiam jasmini, &c *Clus. Hist. Pl. lib. 2. p.* 155.*

This is likewise tender, but so beautiful, that it deserves all the care and labour a gardener can bestow. The leaves are very glaucous, forming a strong contrast to those of other plants, and the flowers are produced in large bunches, their delicate snow-white petals hanging lightly in the air, which they fill with perfume, resembling those of Jasmine. In naming it therefore, instead of our shopmen's vulgar comparison of Paper White, I have adopted CLUSIUS' more appropriate one, which is in fact likewise a specific character. It is probably wild near some of the coasts of Asia Minor, having been sent from Constantinople to Brussels in 1597; but the Dutch florists never succeeded in cultivating it, and we are

* This species probably grows wild near Gibraltar, from whence Mr. THOMPSON brought many bulbs of it, which were lately sold by auction in King-street, Covent Garden.

still, as formerly, supplied with the bulbs from Italy. Anxious to establish it here, I planted it repeatedly in the borders at Chapel Allerton, but the leaves were generally more or less blasted by the frosts, and the roots never survived longer than two or three years. At Mill Hill I had better success, for one bulb, under the shelter of a Laurel on the terrace, where the soil was deep loam thrown up from the adjacent field, continued to live and encrease during all the seven years of my residence there, with no other shelter than the dead leaves blown over it in autumn. This proves that it may be grown in our Island; and I have no doubt, in many situations, by covering the beds with long straw during winter, advantageously for the market: it would probably require no protection whatever, close to the sea. A deep sandy loam, rather moist than dry, and free from all manure whatever, is the soil I would recommend for it.

Hermione Ambigena. *MSS.* Narcissus Incomparabilis. *β. Ker in Bot. Mag. n.* 948. *cum Ic. Optimâ.* Narcissus orientalis. *Linn. Mant. p.* 63. *auctoritate bulborum ex horto Upsaliensi.*

It is exceedingly probable that this is a florist's species, and the remarks of Dr. Sims on the subject deserve to be written in letters of gold: his coadjutor however is mistaken respecting its synonyms, bulbs of it having been sent, with the name of Orientalis, to the late Dr. Hope, from the Upsal garden by Linnæus himself. I refer it to this genus rather than to *Queltia*, from the number of its flowers, and differently inserted filaments. No plant is more hardy, thriving in any soil; but it is not worth cultivating, having coarse leaves, and only from two to four flowers on a stalk.

HERMIONE CUPULARIS. *MSS.* Narcissus Tazetta. *Ker in Bot. Mag. n.* 925. *cum Ic. bonâ.* — *Decand. in Pl. Lil. n.* 17. *cum Ic.* Soleil d'Or, *Floristis Batavis.*

A hardy species, but whether indigenous out of any garden I know not. It forces well, and on this account, as well as the orange tint of its flowers, is much cultivated, though their odour is not the most agreeable. When left to multiply in the open border, it produces comparatively few flowers in a bunch, unless the soil is very deep.

HERMIONE FLORIBUNDA. *MSS.* Grande Primo Citroniere. *Floristis Batavis.*

I dare not quote the beautiful figure in the 946th plate of the *Botanical Magazine* for my plant, which is the *Grande Primo Critoniere* of our shops, with a truncated crown, more like that of the *Soleil d'Or*, and never lobed or split in any that I have seen. In deep moist loam it generally produces from ten to fourteen flowers on the principal stalk, and being very hardy, I can recommend it strongly for general cultivation. Those who grow it, or any other species, for the market, may profit by the following intelligence. Some years ago I gained admittance into the grounds of Mr. DANIEL CARTER, at Fulham, who has long cultivated large quantities of Polyanthus Narcissusses for sale, and was surprised to find all the crop nearly gathered, though very early in the season. His son, however, explained the mystery, by taking me into a large barn, which was filled with the gathered flowers, blowing in pans of water; and he told me that by doing this, the bulbs continued to produce as abundant crops every year, as new ones imported from Holland. The practice was suggested to him by remarking, that in a bed left for seed one

year, very few roots sent up a complete bunch of flowers the following season, and many roots none at all. He therefore now cuts off the stalk close to the ground, as soon as two or three of the flowers are expanded, but is very careful not to injure the leaves. The farmer may here take a lesson from the gardener, and will find the average produce of his hay-fields, as I can speak from experience, greatly increased in a few years, by cutting the grass early; another advantage of which is, that we have very seldom any heavy rains, till after Midsummer day.

Hermione Crenularis, *MSS.* Narcissus Trewianus, *Ker in Bot. Mag. n.* 940. *cum Ic. et ref. n.* 1298. Narcissus crenulatus. *Haworth in Linn. Trans. v.* 5. *p.* 245. Baselman major. *Trew. Seligm. p.* 1. *t.* 23.

A species which, like many more, has possibly risen from seed in the Dutch gardens, between some one of this and the next genus. To the florist its chief merit consists in the fragrance of its flowers, which resembles that of our Primrose Peerless. It is hardy, but the largest imported roots seldom bear more than four or five flowers on a stalk.

Hermione Tegulæflora. *MSS.* Narcissus tenuior. *Curt. in Bot. Mag. n.* 379. *cum Ic.* Narcissus medio-croceus, gramineo folio. *Rudb. Camp. Elys. lib.* 2. *p.* 51. *f.* 5. Narcissus juncifolius minor Clusii. *Lob. Adv. part.* 2. *p.* 492.—*Clus. App. p.* 257.

This is a truly natural plant, and grows wild in Rovergue, from whence the bulbs were sent to Clusius by Monsieur Le Venier. It is exceedingly hardy, and will succeed in any soil, but in deep loam almost every peduncle is bifloro us, and it often ripens seeds. The flowers have a powerful scent,

like those of the following plant, our Primrose Peerless, from which it differs, generically in the structure of its tube and crown.

Narcissus Cothurnalis. *Prodr. p.* 225. Narcissus biflorus. *Smith in Engl. Bot. n.* 276. *cum Ic.*—*Curt. in Bot. Mag. n.* 197. *cum Ic.* Narcissus medio-luteus vulgaris. *Park. Par. p.* 74. *cum Ic.* Narcissus Medio-luteus. *Pass. Hort. vern. p.* 19. *cum Ic.* Majorem illum, &c. *Clus. Hist. Pl. lib.* 2. *p.* 156. *lin.* 52. Primrose Peerless. *Nostratibus.*

Clusius informs us, that in his days this species was supposed to grow wild in England; but Parkinson says he never could hear where, though "so common in all country gardens, that we scarce give it place in our more curious parks." As it is a complete hybrid, it may in future ages disappear: the defect however is not in its male organs, as Mr. Ker imagines, for I have always found perfect pollen in them; but in the ovarium, which never contains any seeds. I venture to say *never*, because I have carefully dissected more than a thousand specimens at various times, without finding even the rudiment of a seed. In a dried one, gathered near Geneva, by Dick, and supposed to be wild, I found none; neither in several from the warmer climate of Montpellier; nor in another from Sherard's herbarium. If this plant had only appeared lately, I should have thought it had been produced by the Dutch florists; but as it was unquestionably in most of our country gardens, so early as the fifteenth century, it is most probably one of Nature's mules. That new species of vegetables may be produced by human art, equally distinct and fertile with those previously in existence, I have not a shadow of doubt; all are alike the works of

God, whether he ordains the unconscious labour of a bee, or the skilful hand of man to he his agent, in conveying pollen of one plant to the stigma of another; and however my opinion may be criticised by those who are under the necessity of spending more time in the closet than in the field, I leave it as a legacy to future gardeners, the full belief and practice of which will reward them with superior flowers, and fruits, to any yet seen or tasted. The name of Biflorus is very ambiguous, for the peduncle has frequently only one, but sometimes three flowers.

Narcissus Radiiflorus. *Prodr. p.* 225. Narcissus poeticus. *Decand. in Pl. Lil. n.* 160. *cum Ic.* Narcissus angustifolius. *Curt. in Bot. Mag. n.* 193. *cum Ic.* Narcissus uniflorus, &c. *Hall. Hist. v.* 2. *p.* 122. Narcissus niveus odoratus circulo rubello. *C. Bauh. Pin. p.* 48. Narcissus medio purpureus stellaris. *Park. Par. p.* 76. *cum Ic.* Narcissus medio purpureus. *Pass. Hort. Vern. p.* 19. *cum Ic.* Narcissus latifol. vi. *Clus. Hist. Pl. lib.* 2. *p.* 156.

This species grows wild in the moist sub-alpine meadows of Switzerland, and will thrive in any border that is not very dry indeed; it flowers here early in April, a little before the following, which having also rather narrow leaves, is often confounded with it, and are both charmingly fragrant.

Narcissus Poeticus. *MSS.* Narcissus albus circulo purpureo. *C. Bauh. Pin. p.* 48. Narcissus medio purpureus præcox. *Park. Par. p.* 76. *cum Ic.* Alterum vero, &c. *Clus. Hist. Pl. lib.* 2. *p.* 156. *lin.* 56.

No modern figure of this species has yet appeared, which there is strong presumptive evidence of being the Narcissus of Theocritus and Virgil: the first of these poets alludes

to the fragrance of its flowers in the words "ευπνοον," as the second does to the colour of its crown in that of "*purpureo*:" but my belief is chiefly founded on the locality of the plant. Clusius, who first distinguished it from the other two species with a scarlet rim, after informing us that he had observed it in some meadows of Languedoc, adds, that it was in those days constantly sent, with other bulbous roots, from Constantinople; and he notices its peculiar character of occasionally producing two flowers on a stalk. I have a specimen gathered in some part of Greece, which Sherard sent to the learned Dr. Uvedale; and to ascertain Clusius' plant more positively, when Broussonet was last in this country, I requested him to send me wild roots from Montpellier. This he did the following year; and had that zealous naturalist's life been spared, I am well assured that we should now have been indebted to him for an exquisitely fine flavoured Plum, which by his directions I long ago met with at Carcassone, and which he believed had been left there by the Moors. The roots from Montpellier proved to be of this species, and one of them produced two flowers on a stalk, which I have never yet seen in *Radiiflorus*, or *Patellaris*.* It is equally hardy, delighting in moist loam, and flowering here immediately after *Radiiflorus*.

* Since the above was written, I have met with a biflorous specimen of *Patellaris*.

APPENDIX.

I. *Some Objects for which the Horticultural Society intend to present Premiums and Medals.*

Read February 5, 1811.

It has been the intention of the Horticultural Society, from its first institution, to present honorary Premiums, or Medals, to such persons as should raise, and produce, before them, any new and valuable variety of Fruit, or esculent Plant, or who should make any important discovery in Horticulture. But as the Society conceived every one of these to be still capable of acquiring a greater degree of perfection, they did not think it necessary to direct the attention of Gardeners to the improvement of any particular plant. Subsequently, however, they have been induced to think, that it might be advantageous, to publish an account of such projected improvements as shall be suggested by their Members, or others, and approved by their Council; and the following are therefore proposed as objects deserving, amongst others, the attention of experimental Horticulturists.

New varieties of the *Potatoe*, better calculated for forcing, and for supplying the markets earlier in the summer, than those at present cultivated.

Other varieties of the same plant, which will afford abundant crops, and be capable of being longer preserved in perfection than any now known, so that the markets might always afford the Potatoe, as nearly as possible, in the greatest state of perfection.

A rich and sweet variety of the common *Red Currant*, which might probably be obtained from seeds, by appropriate selection, through a few successive generations.

New varieties of the *Gooseberry*, which might supply the markets with green fruit at earlier periods, and mature fruit at earlier and later periods than those now cultivated.

New varieties of *Pears*, similar to those which have been introduced from France; but sufficiently hardy to grow and ripen on standard trees, and calculated to supply the markets at a moderate price during winter and spring.

A good and early new variety of *Grape*, better adapted to the climate of Great Britain, in open air, than any now known.

Better and more productive varieties of the *Apple*, and capable of being longer preserved in perfection, than most hitherto known.

A good early *Nectarine*: a variety of the *Strawberry* earlier than the common scarlet; and of the *Cherry*, which would ripen before the Early May.

More early and hardier varieties of the *Peach*, which might succeed better, at least, than any now known, on standard or espalier trees.

Several native varieties of the *Plum* afford blossoms so hardy, that they are rarely injured by frost. Might not rich varieties be obtained by introducing the farina of the fine but tender kinds

into the prepared blossoms of these? It is stated, in the *Pomona Herefordiensis*, that very rich and very hardy varieties of the Apple, have been thus obtained immediately from the seeds of the Siberian Crab.

In pointing out the preceding objects, as deserving the attention of Gardeners, it is not the intention of the Society to limit its patronage to those solely: on the contrary, it is their wish, to promote and encourage successful experiments, in every branch of useful and ornamental Horticulture.

II. *Some Horticultural Observations, selected from French Authors, By the Right Hon. Sir* JOSEPH BANKS, *Bart. K. B. P. R. S. &c.*

Read March 5, 1811.

Peaches.

THOUGH the English excel in many branches of Horticulture, there are others in which they are materially outdone by the French; absolute perfection in any branch of an art, so extensive as that of gardening, cannot be obtained by a person, who allows his talents to range over every part of it. This the French knew long ago, and have regulated their practice accordingly. The English have not yet began this subdivision of skill. Our fruit gardeners, who carry every sort of fruit to market, of a good quality, cannot be said to have brought any one kind to absolute perfection. In France, whole villages are employed in the culture, each of one single kind of fruit. In consequence of this arrangement, the fruits, under the management of individuals, who for many generations have exerted their whole energies to this one point only, are brought to a degree of perfection, which can never be attained in a garden, where fruits and vegetables of all sorts must be provided by one man, for a large and opulent family, or for a weekly market.

At Montreuil,* a village near Paris, the whole population has been maintained, for several generations, by the cultivation of *Peaches*, which is their sole occupation. It is there, alone, where the true management of this delicious fruit can be studied and

* An English tourist tells us, that he had stored his carriage with Peaches, which he thought excellent; when he arrived at Montreuil, the inhabitants there, who offer their fruit for sale to travellers, told him that he would, if he tasted one of theirs, throw those he had got out of his chaise; which, in fact, he did as soon as he had tasted a Montreuil Peach.

attained; for it is impossible, from written precepts, to acquire the whole art. The modes of winter and of summer pruning* are varied not only according to the differences of soil and of exposure, but even according to the state and constitution of each individual tree.

Some of the best of their Fruits are never budded, but always reared from the stone; the rest are budded on stocks of a half wild Peach, called Pêche de Vigne.

Peach trees, budded on an Almond stock, are larger and more durable than others; but they require a deep and light soil, and do not fruit so soon. The best Almonds for stocks are the red shelled sort, and some prefer the bitter; but it is more difficult to succeed with these, than with the soft shelled almond.

Stocks of the Apricot, and the Prune de Saint Julien, produce smaller trees that bear sooner, but do not last so long, and, of course, answer better in a shallow soil.

The season of budding depends on the weather being more or less wet; the end of July, in ordinary years, is proper for the Plum stock, that for the Apricot, and the Almond stock is later: and for the young Almond stock, the middle of September is the most proper.

In order to provide stocks, the fruit stones are sown in baskets; which, when the tree has attained a proper size, are sunk in the ground where it is intended they should grow, provided the soil is deep; for shallow soils the young plant is taken up, and its larger roots cut off, which forces it to throw out lateral roots, and in the event to become a more productive bearer.

* Fruit trees may, in respect to their mode of bearing, be divided into annuals or biennials. Figs, Walnuts, &c. are annuals, that is, they bear their fruit on the branches of the present year; Peaches, Pears, &c. are biennials, their fruit is produeed on wood of the second year's growth. In this case much advantage is derived from the practice of rubbing off the leaf-buds from the fruit-bearing branches, leaving only as many as are wanted to produce wood for the succeeding year. This, no doubt, is the *Taille d'été* of the French; it does not only leave the remaining wood to grow stronger, and to ripen sooner, but it materially increases the size of the fruit. The French use this method with their Figs, as is noticed in the following page.

The climate of France is certainly better suited to the culture of the Peach, than that of England, as some sorts produce their fruit there in perfection on espaliers, and a few on standards in the open air. The people of Montreuil are, however, abundantly more careful, than we are, to protect their trees from the action of frosts, during the time of flowering; at that time a very slight degree of frost is apt to seize upon the pistil, and if the sun shine upon the flower before it is entirely thawed, this organ loses its power of receiving the pollen, and the flower, in consequence, drops off without setting its fruit.

To guard against this, the tops of the peach walls are furnished with long wooden pegs, or with iron wall-hooks, on which planks are fixed; and on them straw mats are hung in such a manner, as to be rolled up or let down at pleasure.

Those who do not use this precaution, light fires with damp straw in such a manner, that the smoke may pass over the flowering branches at sun rise. This intercepts, in some degree, the direct rays of the sun, and, by its gentle warmth thaws the frozen pistils by gradual and slow degrees; others fasten the branches cut from ever-green trees, with their leaves upon them, in front of the Peach Trees, to break off the cold air.

Peaches are never eaten in perfection if suffered to ripen on the tree; they should be gathered just before they are quite soft, and kept, at least, twenty-four hours in the fruit chamber.

Figs.

The inhabitants of Argenteuil near Paris, derive their chief support from the culture of Fig Trees; near that town are immense fields covered with these trees, on the sides of hills facing the South, and in other places sheltered from the North, and the North-west winds.

In the Autumn the earth about the roots of these trees is stirred and dug; as soon as the frosts commence, the gardeners bend down the branches, and bury them under six inches of mould, which is sufficient to preserve them from being frozen.

The branches must be entirely stript of their leaves before this is done; the gardener then taking hold of the top of each branch, bends it down gradually, and with much care, to prevent its breaking, placing his knee or his hand under such parts as resist the most; the branches that will not bend low enough to be buried, are cut off close to the ground.

A Fig Tree will remain buried in this manner seventy-five or eighty days without harm; when the season is mild, the gardeners uncover them, especially in times of warm rains, but on the first symptoms of frost they are again buried. Severe frosts sometimes reach them, but the branches only are destroyed. The roots produce a new crop in the Summer; but these do not bear fruit till the next year, and are more tender and liable to be killed by frost during the next winter, than older and more woody branches.

In the Spring the trees are carefully inspected, and where a double bud is observed, the gardeners, who are able to distinguish a leaf-bud, which is more sharp, from a fruit-bud, which is rounder, pinch out the leaf-bud, without hurting the fruit-buds; these, as they receive the sap prepared by the plant for two purposes, produce fruit of double the ordinary size; this is done at Paris between the first and the tenth of June; but these leaf-buds may be suffered to expand a little, till they can be distinguished with certainty; they must not be all destroyed at the same time. In cool seasons, the ripening of the fruit is hastened by inserting a drop of oil in the eye, from the point of a pen, or tooth-pick,

It is necessary in dry seasons to water Fig Trees; the nature of the plant requires to have its root cool, while its head is exposed to the hottest sun. If planted against the south wall of a house near a spout that brings water from the roof, it thrives luxuriantly. Figs do well also in a paved court; the stones keep the ground under them moist and cool, while the surrounding buildings reflect and increase the heat of the sun's rays.

Apricots.

Our Gardeners believe that the *Moorpark Apricot* is the fruit called *Abricot Pêche* by the French; but this is not the case with all the trees sold under that name. The Abricot Pêche is a large tree, which in France is generally, if not always, raised from the stone without grafting: it ripens later than the rest, not till the end of August. The stone is so soft,* that a pin will pierce through it: the kernel is bitter.

Pears.

The *Crassane* may be improved, and all its harshness destroyed, by grafting upon the Doyenné, a pear known in our gardens.

Apples.

The French do not suffer their Apple Trees, to form wild heads as ours do, and shade all things planted near them; their standard trees, of all kinds, when in gardens, are trained in such manner as to cast the least shade possible. A form like a pyramid, called by them *quenouille*, is very generally used.

Plums.

The *Green Gage*, called in French *La Reine Claude*, is much improved, if grafted on an Apricot or a Peach stock.†

Maize, Egg Plant, and Sweet Potatoes.

All these plants are reared for use in some kitchen gardens of France, though probably not in many.

Maize is sown in the ground, without heat; when the spike is

* This peculiarity of the *Abricot Péche* is ill described by the French author: it really consists of a perforation on the smooth side of the stone, through which, in most cases, a pin may be easily pushed; in some cases the tube is crooked, but still perforated; in a still fewer it is a deep groove, the top not being covered over with stony matter. Our original *Moorpark Apricot* is the *Abricot Péche*. This peculiarity in the stone will serve to distinguish it from the less valuable varieties, which are too often substituted in its place by the nursery gardener.

† This name of *Green Gage* is said to have originated from the following accident. The *Gage* family, in the last century, procured from the monks of the Chartreuse, at Paris, a collection of fruit trees: these arrived in England, with the tickets safely affixed to them, except only the Reine Claude, the ticket of which had been rubbed off in the passage. The gardener being, from this circumstance, ignorant of the name, called it, when it bore fruit, the Green Gage.

about half an inch thick, it is eaten fried in butter, as artichokes are, or made into pickle with vinegar.

The *Egg Plant* is called in the gardens, *Le Plant qui pond.* The seeds of this, as of the other varieties of Solanum, are sown on a hot-bed, in March; the plants, when ready, are transplanted into pots, and plunged in a gentle heat; after the plant has advanced considerably, it may be placed in the open air. The fruit is much used for ragouts in Provence.

The *Sweet Potatoe*, the Convolvulus Batatas of Linnæus, is planted on a hot-bed in the middle of April, in about six inches of mould: when the shoots are eight or ten inches long, they may be taken up, and replanted in a bed of light mould, in the open air, about eighteen inches deep: all the leaves, except the uppermost, are first to be taken off, and the shoot then buried so deep, that the small bunch of leaves only appears above ground. In October the tubers are ripe and ready to be dug up; in doing this, the greatest care must be taken not to wound the skin, as the slightest scratch disposes them to rot. They must be kept free from frost and damp; if exposed to either of these, they exhale an odour like that of the rose, and rot immediately. Both the yellow and the red variety are cultivated in France; the red is preferred.

Strawberries.

The French cultivate the *Alpine Strawberry* in the mode recommended by Mr. KNIGHT in the *Horticultural Transactions,** and find the fruit so much better when produced by seedlings of the first year, that they seem to prefer the *Alpine* to all other sorts, and to be supplied at market with the fruit of it in every month of the year, by the use of some heat in the winter.

The seeds, they say, may be sown either in a little heat, or in the open air, but always in the shade; they should be sown in

* See page 159.

sifted mould, and scarcely covered; have a thin layer of moss strewed over them, and they should be frequently moistened. Fresh seed grows up in eighteen days: old seed is much slower. The runners must be carefully removed.

The market gardeners near Paris sow theirs twice a year, in March, and towards the end of August; in six weeks they are large enough to be transplanted, which is done at eight inches apart. Those sown in March fruit in May and June; those sown in August, the Spring following. I rather suppose that the plants sown in March give their fruit in Autumn.

It is good to sow *Strawberries* within the distance of five or six feet from a north or a west wall; in the latter case, the moss is absolutely necessary. The plants grown from the March sown seed must be well watered through the Summer; in hot weather twice a day, if they are expected to bear in the Autumn. The French seem to find the August sowing most productive. Even in the Autumn, in the Almanac called *Le Bon Jardinier*, the author tells us to sow the seeds of Strawberries in February, if we have not done it in the preceding August.

The *Hautbois* is called in French, *Caperonier;* it is lately only that we have observed a hermaphrodite variety, which bears abundantly; in fact, the plant is polygamous: this the French have long known, and they say that the Chili Strawberry is also polygamous, and that the females may be made fertile by the impregnation of the male flowers of the Hautbois.

III. *On the Cultivation of the* Jamrosade, *Eugenia Jambos of Linnæus, in the National Garden at Paris, abridged from the account given by M.* THOUIN *in the Annales du Museum, Vol.* 1. *page* 857. *By* RICHARD ANTHONY SALISBURY, *Esq. F. R. S. &c. Secretary.*

Read April 2, 1811.

THE *Jamrosade*, or *Eugenia Jambos*, of LINNÆUS, is one of those trees, the fruit of which is seldom brought to perfection in Europe.—In Hindostan, where it grows wild, it is called *Jambos*, or *Jambose*, and in those colonies where it is cultivated, *Jamrosade*, or *Rose Apple*. There are several varieties, differing in the size and colour of their fruit; some red, or reddish; others white and smaller. Rumphius calls the last variety *Jambosa Sylvestris alba*, and this is the tree I now propose to describe.

The species being already well known and figured, I shall only mention the differences peculiar to this variety with white fruit, its habit at Paris, and the method there adopted to make it produce fruit.

Our tree is at present about eleven feet high, with a stem two inches and a half in diameter at the base, branching from below the middle into a pyramidal head. The leaves are undivided, smooth, opposite, of a deep green, coriaceous, and not unlike those of some Peach trees, but larger. The buds push forth young leaves in the beginning of summer, of a most lively red, which change gradually to their permanent deep green colour. The bunches of flowers also appear at this period, terminating the branches, from two to six being clustered together. Petals, four, greenish white, about as large as those of Apple blossoms. Stamens very numerous, in a tuft half as long as the petals, their filaments pale violet colour towards the top, where they diverge, their anthers yellow. Pistil,

longer than all, is inserted like the stamens, petals, and four divisions of the calyx upon a globular germen, which swells into a green fruit, gradually changing to white with a pale rose coloured tinge on the side exposed to the sun.

In size and shape, the fruit is not very unlike a Medlar; its flesh rather firm, but easily broken, near a quarter of an inch thick, slightly acid, and perfumed with a smell approaching that of the Rose, from which it has acquired the name of *Rose Apple* in some of the French colonies: in the middle are several nuts, easily detached from the flesh: if there is only a single nut, it is spherical, but when more are perfected, as is often the case, they become angular in the parts which touch each other. The shell of the nut is thin and brittle, inclosing a greenish white kernel, which easily breaks into irregular pieces. The cavity of the kernel, varying in size and figure, but more or less oval, is lined with a brown pellicle, which adheres very slightly. These fruits ripen from September till December, and though not actually nutritious, their perfumed flavour renders them very agreeable to most palates.

The individual one above described was brought from Hindostan in 1765 by the Abbé GALLOIS, and placed in the late M. LEMONNIER's stove at Versailles. Though very young, by plunging it in the tan-bed, it soon flowered, but never ripened fruit till 1786. When it had attained the height of six feet, it was transplanted into a small box, and exposed gradually to the open air, during two of the hottest months in the year, but afterwards removed back to the tan-bed.

In 1794 this tree was added to the National collection, and being stout and vigorous, I determined to treat it more hardily. During winter, instead of the tan-bed, it stood on the floor of the stove, but near the flue, and during summer it was exposed to the open air, in a sheltered southern exposure, not housing it till October. This method of culture, however, did not agree

with it; for, soon after being put out, most of the leaves fell off, and those which remained, as well as the ends of its branches, turned yellow; a plain indication of its sufferings from the cold nights. Nevertheless, the great heat of our Paris summer soon restoring it to its ordinary vigour, numerous young shoots, and many flowers pushed out, but they fell off without producing fruit. In this way, I persisted to cultivate this tree till last spring (1801), being anxious to try, if in so many years it might not be habituated to our climate; but it annually underwent the same alteration of sickness and health already detailed.*

At this period, wishing to make it produce fruit, I thought all that might be necessary would be a large portion of air with very great heat. For this purpose, it was left in the great stove at the foot of a very white wall, which by reflecting the rays of the sun, increased the heat still more, and the tree was so placed as to receive the rays perpendicularly. The air was suffered to blow freely round it, and it was deluged with water, in consequence of the great evaporation produced by so much heat and air.

My wishes were thus completely fulfilled: the tree grew most luxuriantly, being covered in June with numerous flowers, which were rapidly fecundated, the greater part of them being succeeded by ripe fruits, of which I gathered more than forty. Some of the finest are preserved in the gallery of Natural History; of others which fell off, I have already sown the seeds: and others still on the tree, will be suffered to remain till they drop off spontaneously, that I may be quite certain their seeds are perfectly ripe. From an examination of the kernel, which soon changes to a hard horny substance, it is not surprising, that all the seeds imported from abroad have hitherto failed, unless they

* This account does as great honour to the candour of one of the first gardeners in the world, as his detail of the insertion of the several parts of the flower does to his botanical abilities. *Secr.*

have been sent packed in earth; and I therefore deemed it necessary to sow them in a few days after they fell from the tree.

To make success in this point doubly sure, I employed a method, the good effects of which I have often experienced. This was, after taking the nuts out of the fruit, to put them in my breeches pocket for two or three days. This sort of animal bath is preferable to the custom which has hitherto prevailed, of immersing many seeds of hot climates in pure water.

I finally sowed these nuts about half an inch deep in pots of earth, plunged in a very gentle hot-bed. At the approach of frost they will be removed to the tan-bed of the stove, when the essential point to attend to, will be to moderate the humidity, heat, and light, so that the young plants may not appear till spring.

I dare not hope that this tree will soon be naturalized to live in the open air in any part of France; for, its buds (gemmæ) have no scales; but we may reasonably expect, that the plants raised from seeds here will not be so delicate as imported plants, and that they may succeed in a temperate stove, or orangery; nay, it is even possible, that such plants may survive through winter, in some of the warm spots under our southern maritime alps, or in the island of Corsica. For this purpose, they should be planted with Orange trees, Citron trees, and Guava trees, among which the Jamrosade thrives in its native country, or such colonies as it has been transported to.

IV. *On the Vegetation of high Mountains, translated from a Paper of M.* RAMOND'S *in the Annales du Museum, Vol.* 4. *p.* 395. *By* RICHARD ANTHONY SALISBURY, *Esq. F. R. S. &c. Secretary.*

Read April 2, 1811.

AN observing gardener, on ascending the high mountains of our temperate region, is immediately struck with the vigour and luxurious appearance of their vegetation. The plants he has seen in the adjacent plains are changed in size, aspect, and form, so that he hardly recognises the most common. Their stems are elevated, their flowers larger, even the leaves of the trees have acquired a size, which makes him doubt the identity of the species. The woods are more impenetrable, the turf of the downs closer, and a green more lively, fresh, and brilliant, colours every thing, from the depths of the valley, up to those heights, where the eye can discern nothing but naked rocks, and eternal snows.*

Thus, endowed with a vigour elsewhere unknown, vegetables there hasten with increased energy through the various periods of their existence. Time, which to them moves slowly in the plains, in the mountains flies. There, every thing is done rapidly; meteors dart after each other, and the air is in perpetual agitation. From all these controlling causes, acting together

* The first part of this sentence rather applies to purely mountainous plants, such as *Aster alpinus*, *Viola grandiflora*, *Aquilegia vulgaris*, &c. than to all vegetables indiscriminately: the latter part I should explain by saying, that the foliage of the trees was rather diminished, in the dry plains, at the base of the *Pyrénées*, than enlarged by mere elevation; but along with elevation, to a certain extent, perpetual moisture and food are washed down to their roots; and such a situation, in France, is probably the aboriginal one of the trees in question. *Secr.*

in full force, germination, florescence, and fructification, take place almost simultaneously. Sometimes, with a wind blowing from the south, with a heavy shower, or with a scorching sun, the face of the meadows, downs, and forests, in a moment changes, and the whole of a particular species seems to vanish: in fact, there, every fine day is a spring to some particular assemblage of vegetables, or to some of the inaccessible heights in which they grow.

To this picture, another succeeds. If we examine the mountains, and vallies, every place has its peculiar soil, every different elevation its peculiar climate, and each of them its characteristic vegetables. In the plains, these vegetable assemblages occupy vast spaces, the limits of which are too extensive, and indeterminate, to be easily perceived. On the contrary, in the mountains, they are confined to narrow limits, which the eye often takes in at one view. In a gentle rising extended between two dales, in a pile of rocks, or in a cliff, which the traveller ascends in a few moments, he finds the perpetual barriers of those productions, which nature has been pleased to separate.

Among the various causes of these separations, one seems to reign predominant over all others; this is elevation above the level of the sea. In every 100 inches in height, the temperature falls about half a degree of our thermometers. After that degree of cold, which generally puts a stop to all vegetation, an eternal frost prevails on the summit of these Alps, as at the poles, and every 100 metres of vertical elevation corresponds nearly to one degree of the distance, at which the mountain is placed from the pole.

By this scale, the various phenomena of different climates in our globe may be easily understood; circumstances may differ, but the general results will be nearly the same. While the increase of cold is accompanied by a diminution of the column of

air, it is also affected by the obliquity of the rays of the sun; and the distribution of vegetables in all Alpine countries, depends principally on these two causes.

Thus in the Swiss Alps, and Pyrenees, trees cease to grow at about 2400 or 2500 metres of actual elevation, as they do about the 70th degree of north latitude; and that circle these gigantic vegetables occupy, is divided into several lesser bounds, which have each their peculiar characteristics. At the foot of the mountain we find the *Oak:* in the middle region the *Beech:* above these the *Fir* and *Yew* succeed, which soon give place to the *Pine* (Pinus *Sylvestris* Linn.) Along with this last mentioned tree, in the Swiss Alps, the *Larch* and *Cembro* (Pinus *Cembra* Linn.) also grow wild, which are unknown in the Pyrenees. The *Cedar of Lebanon* would probably thrive as well on these mountains, as on those of Asia, had it been fixed there; but such is still the mystery of the original dissemination of vegetables, that Nature seems by turns, indifferent to the similitude of places, or to the distance between them; sometimes bringing together in the same climate, plants of the most distant countries; and sometimes denying this conformity of vegetables to regions exactly alike, both in soil and temperature.

In this zone of trees, the *Rhododendron ferrugineum* Linn. a little shrub peculiar to the mountains of Europe solely, is very abundant. It never descends into the plains, and can hardly be cultivated in a garden, demanding its native air, soil, water, nay snows, and even there only occupies particular spots. Nothing is more beautiful when in flower, but nothing is more untractable. In the Pyrenees, it first appears at exactly 1600 metres of elevation, stopping as precisely at 2600 metres, and within these limits, is so abundant and vigorous, that it would be as difficult to extirpate it there, as it is to cultivate it elsewhere.*

* No shrub is more plentiful, or easily cultivated in the gardens about London, if

The Juniper traverses far beyond this circle, up to the elevation of 2900 metres, but this shrub, as it ascends, gradually loses the habit and appearance, which distinguish it in our plains: there it resembles the Juniper of Sweden, and Lapland, with a low spreading stem, prostrate on the ground, seeking an asylum as it were by instinct on those sides of the rocks exposed to the south or west, against which it spreads out its branches into an espalier, with a regularity which art can seldom attain.*

In a more elevated region, we find the rigour of the climate will not permit the existence of any shrub whatever, which the first snows do not entirely cover. Still higher, even this shelter is insufficient, and nothing but a few herbs with perennial roots actually under the earth, subsists. Nature has almost entirely banished from such places, annual plants; where the whole summer is reduced to a few days, nay, sometimes a few hours; where often a storm of wind, or dripping fog, will destroy the flowers which have scarcely blossomed, and, bringing back winter, terminate the year.

On the contrary, hardly any elevation seems to stop the progress of some perennials, which on the approach of severe cold, shelter themselves under the double protection of the earth and snow, forming their buds underground, and springing up the first fine day of the succeeding year. Their duration exhausts the chances of all times and seasons, till, sooner or later, they also ripen seed, by which they are multiplied.

Thus the vegetable zone of our Alps has in fact no other limits, than those of the earth or soil covering them. The Pic du Midi, which I have ascended 26 times, is 3000 metres above the level of the sea, but I never once found the thermometer there rise to

planted in light sandy peat under a rock, or north-west wall, and watered plentifully in dry weather. *Secr.*

* Two distinct species are probably here confounded, an opinion in which I was confirmed by the late Mr. Dryander. *Secr.*

the temperate point. Yet, on a nearly bare rock, I have there gathered as many as forty-eight species of vegetables, excluding cryptogamous plants: of these, one only, which perhaps I may never find again, was annual. At Nieuvelle, a place 250 metres higher than the Pic du Midi, where the thermometer in summer never rises to more than 8 degrees of Reaumur, I have in five journies collected twelve different perennials. On the top of Mont Perdu, at an elevation of 8500 metres, even in the bosom of permanent snows, but on rocks whose sloping situation had cleared them of snow, I have seen six different plants very vigorous. Here, in one of the hottest days of a summer remarkable for its heat, the thermometer only rose to 55° above the point of congelation, and it undoubtedly falls in winter to 25 or 30: nor is it certain, that those six plants, found in a season which melted more snow than usual, are regularly uncovered every year. Besides, I have seen some of them on the borders of the perpetual snow, with only half of their stems exposed and vegetating, the other half buried in it,* and it is probable, that many of them do not see the light ten times in a century, running through the whole course of their vegetation in a few short weeks, and doomed afterwards, to sleep through a winter of many years.

Plants subjected to so singular a mode of existence are not among the species which grow in the plains of our temperate regions: they belong exclusively to such as grow on the summits of mountains, or near the poles. Norway, Lapland, and Greenland, furnish plants analogous to those of the Swiss Alps and Pyrenees, but few, or possibly none of them, are seen in Siberia, Kamschatka, or even in the polar regions of America. One would hardly have supposed so great a diversity of vegetable productions in coun-

* A similar case occurred in a vine at Chapel Allerton, planted in the open air, at some distance from the stove; a branch of which, however, being introduced into the stove early in January, was loaded with clusters of grapes, before any of the buds exposed to the open air, shot out. *Secr.*

tries so much alike and near each other, nor on the other hand, so great a conformity as exists among the plants of some of these countries, and the plants of some Alpine regions distant from them 40 degrees.

In fact, we learn from actual observation, that the dissemination of vegetables is not always regulated in parallel distances from the equator: that if a certain number of plants, confined by their constitution to a peculiar climate, are to be found to a certain distance under the same latitudes, many others, on the contrary, have been scattered over different countries in the direction of their meridians. Towards the south, America, Africa, and Asia, towards the north, Europe, Asia, and America, are far from producing the same vegetables under the same parallels; while many plants, growing wild in each of these grand divisions of the globe, brave every obstacle opposed to them by a diversity of climate, and propagate themselves in a geographical direction, quite contrary to that, which a similar climate would confine them to.

Thus, for example, many of the curious plants of Sardinia, Sicily, and Italy, mount up the Swiss Alps, and then descend again into the lower parts of Germany, without being allured by our fine climate to France. Thus, likewise, the Pyrenees receive from Spain a great number of the plants from Barbary, scattering them over the western provinces of France. The *Merendera*, which grows in the north of Africa, is found in Andalusia, Castile, Arragon, when crossing the Pyrenees it descends as far as the Landes de Bourdeaux. The *Narcissus Bulbocodium*,* and *Hyacinthus Serotinus*,

* Here the celebrated author confounds three very distinct species. The Plant of the Pyrenees is the *N. Bulbocodium* L. with erect leaves, very hardy, and brought forced to Govent-garden in abundance every spring. The plant of Barbary and Andalusia which I received from the late Professor BROUSSONET is more dwarf, with leaves spreading flat on the ground, and so tender, that it will only live here through winter, in very warm sandy soils, close to a wall. The plant of Castile grows also near Oporto, and differs from both the others, in having a six-lobed plaited crown, with very narrow leaves: it is not very tender, but requires a dry sandy soil. *Secr.*

grow wild in the same places, and follow the same route. The *Anthericum Bicolorum* of Algiers, traverses the same chain of mountains, and arrives in Anjou. The *Scilla Umbellata* and *Crocus Nudiflorus*, have migrated from the Pyrenees even into England. Yet not one of the above mentioned vegetables has been disseminated laterally, to meet those southern ones which have crossed the Swiss Alps.

But it is in the great valleys of the Pyrenees, extending from north to south, that these vegetable galaxies become most striking and singular. The *Dianthus Superbus* runs through the whole valley of Campan and Gavarnie, without ever entering any of the side ones. The *Verbascum Myconi*, that beautiful and scarce plant, which does not belong either to the genus in which LINNÆUS has placed it, or perhaps to any natural order yet defined, and which has so exotic an appearance, that it distinguishes itself, like the *Kingfisher*, among our indigenous birds, invariably keeps to the same direction. Nothing is more abundant in all the great valleys of the Pyrenees, in every soil and exposition: yet the very same soil and exposition never attract it to any of the collateral ones. I could cite a multitude of similar examples, but it is sufficient at present, to mention one more, the *Box* Tree. This shrub, so very robust, is affected by elevation like the most delicate ones. At the base of the Pyrenees, both on the French and Spanish side, it covers every hill: from thence it enters the great valleys, running from the north-east towards the south, but never quits them; in vain do the numerous branches of these valleys offer it an asylum; passing their openings, it keeps to its first direction, stopping on the crest of the chain at about 2000 metres above the level of the sea, and appearing again on the other side at a similar elevation, and in a similar direction, from which it never deviates.

Thus it is, that in high mountainous countries, we discover the strongest traces of the original design of nature; there each order of vegetables is confined within narrower bounds; there local

influence more powerfully resists every other. Nevertheless, the lapse of ages, and especially the presence of man, has here introduced many modifications; for, in traversing the immense deserts of these high mountains, among the rare plants which form their herbage, some few of the commonest here and there occur. If the verdure takes a deeper tint than usual, contrasted with the gayer colour of the Alpine turf, the ruins of a hut, or a rock blackened by smoke, explain the mystery. Around these asylums of man, we find naturalized the common *Mallow*, *Nettle*, *Chickweed*, and common *Dock*. A shepherd had possibly sojourned here some weeks, and in driving his flocks here, had also attracted without knowing it, the birds, the insects, the seeds of the plants of his lowland cot. He may possibly never return, but these wild spots have received in an instant the indelible impression of his footsteps; so much weight has a being of his importance in the scale of nature. In other places, by destruction he has signalised his presence. Before he approached the mountains, the immense forests which covered their bases have fallen under his axe, for woods are not the abodes of man; he avoids the circuitous paths of so vast a labyrinth, suspecting danger under their shades; he there mourns the absent sun, an object which every day renovates his delight; and therefore it is seldom that he penetrates a forest, without fire and sword in hand.

Accordingly the seeds of woodland plants become dormant in a soil now dried by the sun and wind, and no longer suitable to their germinating, Other vegetables take their places, the climate itself changing; for the temperature rises, the rains are less frequent, but more copious, the winds more inconstant and impetuous, deep gullies are formed in the sides of the acclivities by torrents, and rocks are deprived of the earth which covered them, and, at the same time, of the plants which ornamented them, by falls of immense loads of melting snow: thus the face of the

globe, where man inhabits, is more changed in one century, than in twenty where he is absent.

After all, in Alpine countries, the different soils, and their productions, retain most of their aboriginal character: there the primitive distribution of vegetables has been least disturbed; their localities can be easily traced, the influence of the air is most perceptible; there the contiguity of objects exhibiting more forcibly their similitudes and dissimilitudes, the eye of the observer takes in at one glance every trait, which is interesting; and if it is necessary for the geologist to visit these grand chains of mountains, to study the structure of the earth and those catastrophes, which have imprinted its present form, it is still more so for the horticulturist, who wishes to penetrate the mysteries of the primary dissemination of vegetables and their subsequent propagation, hoping thence to derive hints for their successful cultivation, and improvement, in the paradise surrounding his dwelling.

V. *Description of a Bank for* Alpine *Plants, by Monsieur* THOUIN, *abridged from his Paper in the* Annales du Musée, *Vol.* 6, *page* 183. *By* RICHARD ANTHONY SALISBURY, *Esq. F. R. S. &c. Secretary.*

Read April 2, 1811.

PLANTS from Alpine and frozen countries are cultivated in the Jardin des Plantes at Paris, on a *Bank*, sixty feet long, placed against the wall of a terrace, ten feet high, which faces the south-east so much, that the sun ceases to shine upon it between 10 and 11, A. M. This bank is divided into five steps, one foot wide, by nailing planks of oak, ten inches deep, to the top of as many rows of strong posts, charred at the bottom, and driven firmly into the ground; the taller posts are still further secured in their places by cross bars let into the wall.

Through the whole length of this bank runs a ditch, two feet deep, but sloping gradually towards the front up to nine inches in height, under the general level of the ground; and in making this ditch, its sides were plaistered six inches thick with mortar of brick mould and chopped straw, filling up all the cracks which appeared during the week it was left exposed to the air. After nailing the planks to the posts, the natural soil, which is of a light nature, was thrown into the hollow up to within about a foot of the surface of the slope, above which it was filled with sandy peat, such as Ling and Heaths grow in, passed through a screen. My reason for using all these precautions was to prevent the water necessary for the health of those Alpine plants in summer, running off too quickly into a bed of dry gravel underneath: in a naturally moist soil, that expense and trouble may be saved.

I have sown on this bank the seeds received not only from the Alps, but several other frozen regions: for it is probable that the elevation of the atmosphere near the Poles corresponds with that of the highest mountains in France, rising gradually towards the equator; nor is this consideration so foreign to the business of a gardener in naturalizing vegetables, as might be at first supposed.

Roots of all the Alpine plants I could collect, have also been planted in this bank, and they thrive much better than when cultivated in pots on a stage, however open or airy, so that most of the following have greatly increased both by seeds and roots. *Moehringia Muscosa, Viola Biflora, Androsace Carnea,* and *Lactea, Soldanella Alpina, Primula Farinosa,* Tussilago Alpina, Artemisia Glacialis, Salix Myrsinites, Retusa,* and *Reticulata.*

The culture they require is, 1st, to keep the bank carefully weeded: 2dly, to reduce within bounds, many that grow and spread rapidly so as to exclude others: 3dly, to dig and lighten the surface frequently, that it may absorb air and water more readily: 4thly, to add three inches in depth of fresh sandy peat every year, in place of the old, which soon loses its *humus,* or nutritious part: 5thly, in giving the plants, at a certain season, not only daily, but hourly waterings; but this being one of the most important points, I shall enlarge more fully upon it.

Almost all Alpine plants are of humble stature, growing on steep declivities of rocks in a layer of *humus,* or vegetable earth, formed by the decomposition of *Jungermannias, Lichens,* and *Mosses.* The greater part of the year, they are covered with a bed of snow, which only begins to melt at stated periods of the day, after the rays of the sun have acquired great force. Then only do these Alpine plants awaken from torpidity, exhaling

* I have constantly found this plant growing wild in wet meadows that are seldom dry even in summer, at the foot of the mountains, and even in bogs. *Secr.*

quickly in this light black soil, the moisture which they have absorbed during the night: but the returning sun which excites them to action, also melts the snow above, the waters of which trickling down to their roots, give immediate refreshment. The sun, disappearing, these little vegetables are no longer exhausted, and a continuance of moisture would even be hurtful; accordingly the snow resuming its solid consistence with the cold of the night, this natural irrigation ceases, with a degree of exactness that the most careful gardener cannot perform.

From the above remarks, it will easily be deduced, that Alpine plants should have no water at all during winter and moist weather: on the contrary, that they should be kept perpetually moist during hot sunshine, by water dribbling through the soil to their roots, without wetting their leaves, which immediately evaporating by the heat, will cool the air just above them. In fact, it is only by a close imitation of the process of nature, that these vegetables of cold regions can be successfully cultivated in botanic gardens.

The last essential point relative to Alpine plants, is to cover them up on the approach of frost: this may appear a strange precaution to some, but when winter commences in their native soil, being immediately covered with snow to the depth of seven inches, they never feel a greater degree of cold than that of the freezing point, the soil itself being hardly frozen. The best covering is that of *Fern, (Pteris Aquilina,)* which does not absorb moisture so quickly, as most other sorts of haum.

VI. *Notice from a Work of Monsieur* LELIEUR, *on the hereditary Diseases of Fruit Trees. By the Right Hon. Sir* JOSEPH BANKS, *Bart. K. B. P. R. S. &c.*

Read January 6, 1812.

M. LELIEUR, a French gentleman who holds the office of Administrator of the Parks and Gardens of the Crown, has lately published a book on the diseases of Fruit Trees.

In this he asserts, that the disease called in French *Le Blanc*, or *Le Meunier*, which shews itself by a mealy whiteness on the leaves of the Peach Tree, or on the fruit itself, in blotches that destroy the flavor, is an hereditary disease: that plants raised from the kernels of trees, subject to this disease, will produce plants in like manner infected, and which will communicate the disease to grafts taken from sound trees inserted in them, and that grafts from diseased trees will certainly be diseased, although taken from branches that are quite free from it.

He attributes the same hereditary continuance to the *Gum*, a disease more mischievous possibly than any other, to our grafted and budded stone fruits; and he is of opinion that this disease also may be entirely avoided, by grafting from trees that never have been subject to its attacks.

The importance of these facts to the interest of Horticulture, will, it is hoped, justify the writer for offering this short account of them to the Society, though they are taken from the *Moniteur* of the 7th December, 1811, the book not having been yet brought into this country.

The mealy disease, he says, is certainly not contagious, and he instances a fruit-wall at Versailles, on which are many curious Peach Trees, some of which are much damaged by it, while others are entirely free from it.

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London: Printed by W. Bulmer and W. Nicol,
Cleveland-Row, St. James's.